**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION**

ONE-E-WAY, INC., Plaintiff, v. DELL TECHNOLOGIES INC. and DELL INC., *Defendants.*	CIVIL ACTION NO. 1:24-cv-01558-RP (LEAD) **JURY TRIAL DEMANDED**
ONE-E-WAY, INC., Plaintiff, v. ANKER INNOVATIONS, LTD., *Defendant.*	CIVIL ACTION NO. 1:24-cv-01559-RP **JURY TRIAL DEMANDED**
ONE-E-WAY, INC., Plaintiff, v. SAMSUNG ELECTRONICS CO., LTD, and SAMSUNG ELECTRONICS AMERICA, INC., *Defendants.*	CIVIL ACTION NO. 1:24-cv-01561-RP **JURY TRIAL DEMANDED**

**PLAINTIFF'S FIRST AMENDED COMPLAINT SAMSUNG ELECTRONICS
CO., LTD, AND SAMSUNG ELECTRONICS AMERICA, INC.**

Plaintiff One-E-Way, Inc. ("One-E-Way" or "Plaintiff") hereby files its First Amended

Complaint against Defendants Samsung Electronics Co., Ltd. and Samsung Electronics America,

Inc. (collectively, "Samsung" or "Defendants") alleging infringement of U.S. Patent Nos.

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10,129,627, 10,468,047, and 9,107,000 (collectively the "Patents-in-Suit").

I. PARTIES

1.   Plaintiff One-E-Way, Inc. is a Delaware corporation that, as of the date of this Complaint, has its principal place of business at 3016 E. Colorado Blvd. STE 70848, Pasadena, California 91107.

2.   Upon information and belief, Samsung Electronics Co., Ltd. (individually, "SEC"), is a corporation organized under the laws of the Republic of Korea, with its principal place of business located at 129 Samsung-Ro, Maetan3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-do, 443-742, South Korea. SEC may be served with process pursuant to Federal Rule of Civil Procedure 4(f)(1). Upon information and belief, SEC is authorized to do business in Texas. On information and belief, SEC is South Korea's largest company and one of Asia's largest electronics companies. SEC designs, manufactures, and provides to the U.S. and world markets a wide range of products, including consumer electronics, computer components, and myriad mobile and entertainment products.

3.   Upon information and belief, Samsung Electronics America, Inc. (individually, "SEA"), is a corporation organized under the laws of the State of New York with its principal place of business at 85 Challenger Road, Ridgefield Park, New Jersey 07660. Upon information and belief, SEA is authorized to do business in Texas. SEA may be served through its registered agent CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201-3136. On information and belief, SEA was formed in 1977 as a subsidiary of SEC and markets, imports, sells, and/or offers for sale a variety of consumer electronics.

4.   SEC and SEA have waived service of process in this case.

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II. JURISDICTION AND VENUE

5.   This is an action for patent infringement which arises under the Patent Laws of the

United States, in particular 35 U.S.C. §§ 271, 281, 284 and 285. This Court has jurisdiction over

the subject matter of this action under 28 U.S.C. §1331, §1338(a).

6.   This Court has personal jurisdiction over Samsung for several reasons. Among

other reasons, Samsung maintains regular and established places of business in Texas, including

large facilities in Austin and Plano. Samsung conducts a great deal of business in Texas and has

established minimum contacts within the forum such that the exercise of jurisdiction over Samsung

will not offend traditional notions of fair play and substantial justice. Samsung has purposefully

and voluntarily availed itself of the privileges of conducting business in the United States, the State

of Texas, and this District by continuously and systematically placing goods into the stream of

commerce through an established distribution channel with the expectation that they will be

purchased by consumers in the State of Texas and this District. Samsung directly and/or through

intermediaries (including distributors, sales agents, and others), ships, distributes, sells, offers to

sell, imports, advertises, makes, and/or uses its products (including but not limited to the products

accused of infringement herein) in the United States, the State of Texas, and this District. Finally,

Samsung has participated in many lawsuits in courts within the State of Texas, including this

Court. As such, it has long been established that Samsung is subject to personal jurisdiction in

Texas. One-E-Way's causes of action arise from Samsung's contacts with and other activities in

the State of Texas and this District.

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7.   Venue is proper in this Court pursuant to 28 U.S.C. §§1391(b), (c), and 1400.[1] Samsung maintains regular and established places of business within this district, including at 12100 Samsung Blvd., Austin, Texas 78754; 2800 Wells Branch Parkway, Austin, Texas 78728; and 3900 N Capital of Texas Hwy, Austin, Texas 78746.

8.   Although the foregoing is sufficient to establish that Samsung is subject to personal jurisdiction in this Court and that venue is proper, One-E-Way further pleads that SEC and SEA, individually and collectively as a common business enterprise, conduct business operations in the Western District of Texas at facilities located at least at 12100 Samsung Blvd., Austin, Texas 78754; 3900 San Clemente Suite 300, North Capital of Texas Highway, Austin, Texas 78746; 7300 Ranch Road 2222, Austin, Texas 78730; and 1700 Scenic Loop, Round Rock, Texas 78681.

9.   SEC and SEA, individually and collectively as a common business enterprise, develop, sell, and/or market Samsung products pertinent to this Complaint in the Western District of Texas and throughout the State of Texas, at Samsung's Austin facilities and through authorized sellers and sales representatives such as: AT&T Store at 1011 W 5th Street Austin, TX 78703; Verizon Store at 1011 E 5th St, Austin, TX 78702; Best Buy at 1201 Barbara Jordan Blvd., Ste 100, Austin, TX 78723; and Amazon.com. In addition, Samsung has sold, advertised, marketed, and distributed products in this District that practice the claimed inventions of the Patents-in-Suit. Samsung derives substantial revenue from the sale of infringing products distributed within the District, and/or expects or should reasonably expect its actions to have consequences within the district and derives substantial revenue from interstate and international commerce.

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[1] SEC is a foreign corporation, and thus venue is proper in any judicial district. *See* 28 U.S.C. § 1391(c)(3).

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10.   Joinder of SEC and SEA is proper because they are related entities that are either

jointly and severally liable for infringement, or that make, use, sell, offer to sell, and/or import the

same or similar products accused of infringement herein. Further, upon information and belief,

SEC and SEA use common and/or substantially similar underlying hardware and/or software in

their infringing products and therefore the factual question of infringement will substantially

overlap between SEC and SEA. One-E-Way anticipates there will be substantial overlap with

respect to discovery.

III.   FACTUAL BACKGROUND

<u>ONE-E-WAY AND THE INVENTOR</u>

11.   C. Earl Woolfork first conceived of the wireless audio inventions underlying the

Patents-in-Suit in the late 1990s while he was exercising outdoors at the popular Santa Monica

Steps in Los Angeles. At that time, Mr. Woolfork observed many people having their exercise

routines interrupted or negatively affected by the wire(s) connecting their headphones to their

respective portable audio players: "I'd see people going up and down exercising, and the cord was

not only a nuisance but it was also potentially dangerous," Mr. Woolfork explained.[2] Determined

to address these issues, Mr. Woolfork sought to develop a "wireless" solution that would enable

people to enjoy high quality music on-the-go and be free of the complications and frustrations of

headphones wire(s). Ultimately, Mr. Woolfork—who had an electrical engineering degree from

the University of Southern California in Los Angeles—designed a wireless audio system that could

transmit and receive high quality audio data without the physical complications caused by the

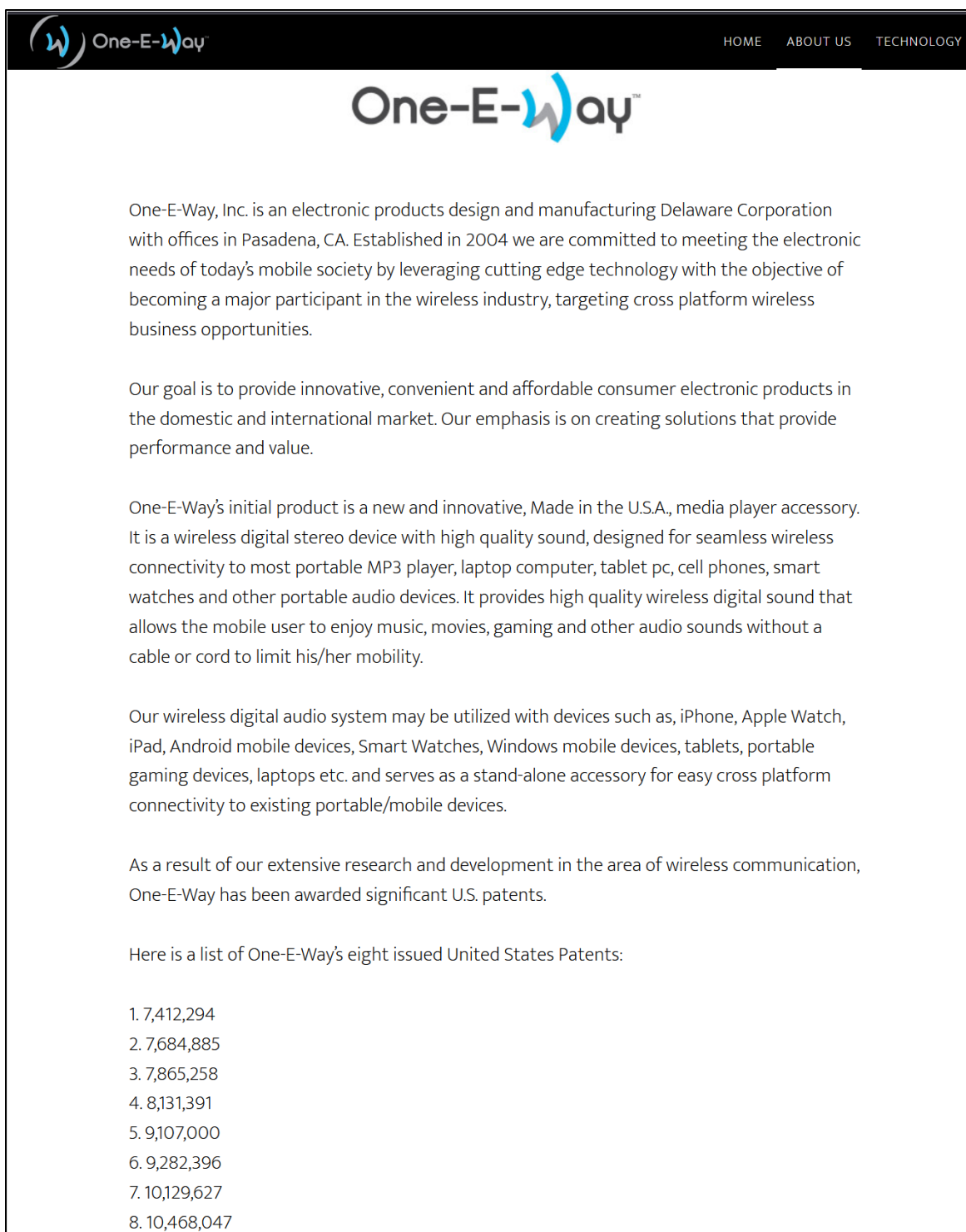conventional use of wires to transmit the audio signals. Mr. Woolfork then filed a patent

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[2] *Earl and Cedric Woolfork: CEO And CFO of One-E-Way,* US INVENTOR,
https://usinventor.org/portfolio-items/earl-and-cedric-woolfork-ceo-and-cfo-of-one-e-way/ (last
visited Nov. 14, 2024).

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application with the United States Patent and Trademark Office to protect his inventions and ultimately obtained several U.S. patents on various embodiments of his invention(s).

12.   Subsequently, in 2004, Mr. Woolfork founded One-E-Way—a small, minority-owned business—in Pasadena, California to commercialize his inventions and One-E-Way also serves as the assignee of Mr. Woolfork's patents. One-E-Way maintains a website at http://one-e-way.com/.

http://one-e-way.com/.

One-E-Way

One-E-Way, Inc. is an electronic products design and manufacturing Delaware Corporation with offices in Pasadena, CA. Established in 2004 we are committed to meeting the electronic needs of today's mobile society by leveraging cutting edge technology with the objective of becoming a major participant in the wireless industry, targeting cross platform wireless business opportunities.

Our goal is to provide innovative, convenient and affordable consumer electronic products in the domestic and international market. Our emphasis is on creating solutions that provide performance and value.

One-E-Way's initial product is a new and innovative, Made in the U.S.A., media player accessory. It is a wireless digital stereo device with high quality sound, designed for seamless wireless connectivity to most portable MP3 player, laptop computer, tablet pc, cell phones, smart watches and other portable audio devices. It provides high quality wireless digital sound that allows the mobile user to enjoy music, movies, gaming and other audio sounds without a cable or cord to limit his/her mobility.

Our wireless digital audio system may be utilized with devices such as, iPhone, Apple Watch, iPad, Android mobile devices, Smart Watches, Windows mobile devices, tablets, portable gaming devices, laptops etc. and serves as a stand-alone accessory for easy cross platform connectivity to existing portable/mobile devices.

As a result of our extensive research and development in the area of wireless communication, One-E-Way has been awarded significant U.S. patents.

Here is a list of One-E-Way's eight issued United States Patents:

1. 7,412,294
2. 7,684,885
3. 7,865,258
4. 8,131,391
5. 9,107,000
6. 9,282,396
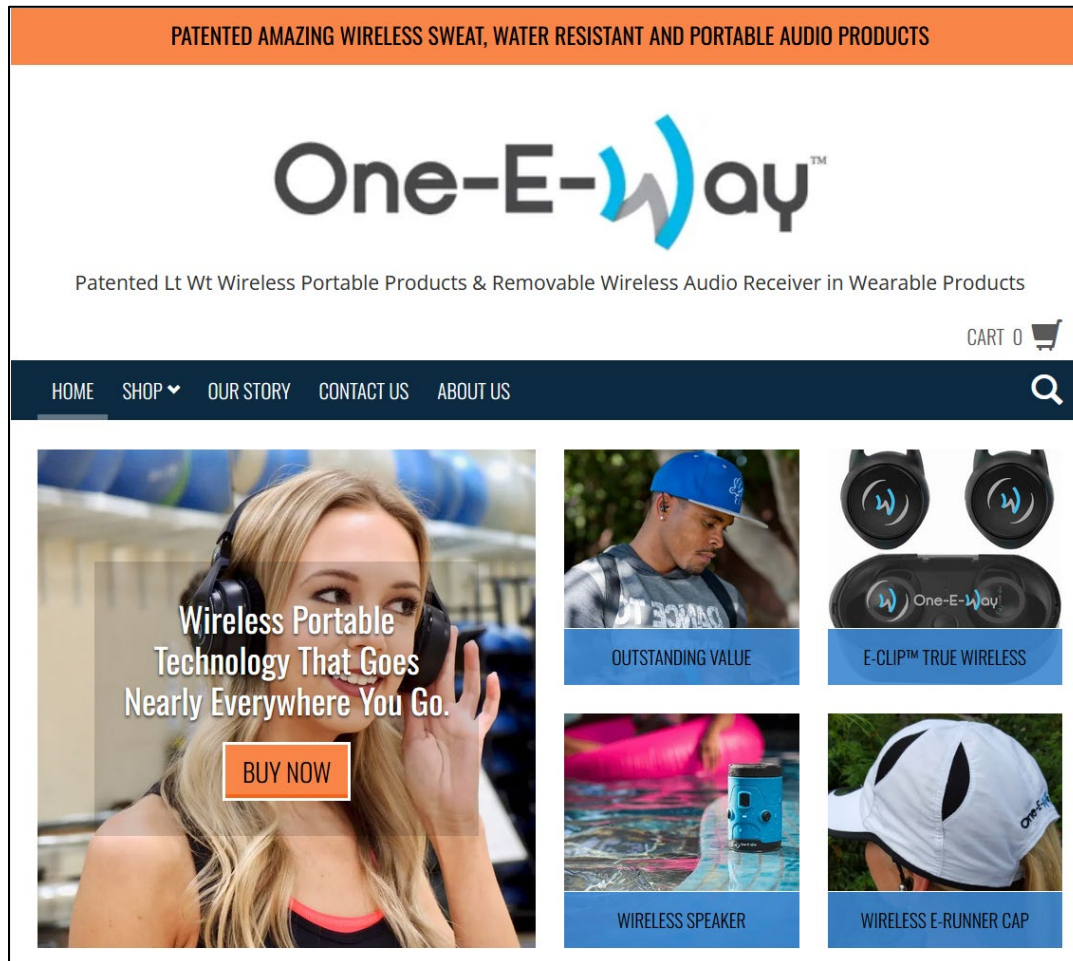7. 10,129,627
8. 10,468,047

http://one-e-way.com/about-us/.

13.   One-E-Way's initial commercial product was a wireless digital audio accessory designed to easily connect with a variety of portable audio devices—e.g., MP3 players, laptops,

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tablets, and smartphones—to deliver high-quality, wireless audio for users to enjoy their music, movies, games, and more. One-E-Way sells its patented wireless audio products at least through its online retail outlet https://shop.wayvz.com/.

https://shop.wayvz.com/.

<u>PATENTS-IN-SUIT</u>

14.   One-E-Way is the owner of all right, title, and interest in and to U.S. Patent No. 10,129,627, entitled "Wireless Digital Audio Music System," (the "'627 Patent") with a claim of priority to December 21, 2001. The '627 Patent duly and legally issued on November 13, 2018.

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15.   One-E-Way is the owner of all right, title, and interest in and to U.S. Patent No. 10,468,047, entitled "Wireless Digital Audio Music System," (the "'047 Patent") with a claim of priority to December 21, 2001. The '047 Patent duly and legally issued on November 5, 2019.

16.   One-E-Way is the owner of all right, title, and interest in and to U.S. Patent No. 9,107,000, entitled "Wireless Digital Audio Music System," (the "'000 Patent") with a claim of priority to December 21, 2001. The '000 Patent duly and legally issued on August 11, 2015

17.   The Patents-in-Suit are members of the same patent family and each claims priority to the parent patent application in the family—U.S. Patent Application No. 10/027,391, which was filed on December 21, 2001.

18.   The Patents-in-Suit have expired. The "Period of Exclusivity" runs from the period of enforceability until the latest expiration of the Patents-in-Suit.

<div align="center">PRIOR LITIGATION AND ENFORCEMENT</div>

19.   One-E-Way has successfully enforced its patents in multiple venues against multiple companies over the years, including overcoming multiple IPRs and validity challenges.

20.   On July 16, 2020, One-E-Way filed a patent infringement lawsuit against Apple Inc. asserting that Apple Inc. infringed two of the three patents currently asserted against Defendants ("*Apple* litigation"). In the *Apple* litigation, among other allegations, One-E-Way asserted that the Channel Access Code ("CAC") and the Logical Transport Address ("LT_ADDR") parameters used by certain portions of the Bluetooth specification qualified as the "unique user code" claimed in One-E-Way's asserted patents. Ultimately, the *Apple* litigation ended after the district court held, and the Federal Circuit affirmed, that the CAC and LT_ADDR parameters accused by One-E-Way did not infringe the claimed unique user code.

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TECHNICAL OVERVIEW

21.   The Patents-in-Suit are generally directed to wireless audio inventions that reduce or eliminate the conventional reliance on physical cables to transmit audio signals, and the problems associated with such cables, while still providing high quality, private listening for users and reducing interference from other device transmissions. For example, the specification of the Patents-in-Suit describes that code division multiple access technology ("CDMA") "may be used to provide each user independent audible enjoyment." *See* '627 Patent, 3:30-32. Further, the patented inventions address interference in the wireless audio spectrum by using, for example, differential phase shift keying and processing for reduction of intersymbol interference. *See, e.g., id.*, 2:55-60; 5:7-8.

22.   Figures 2 and 3 of the Patents-in-Suit depict the audio transmitter and audio receiver portions, respectively, of select embodiments of the claimed wireless digital audio systems.

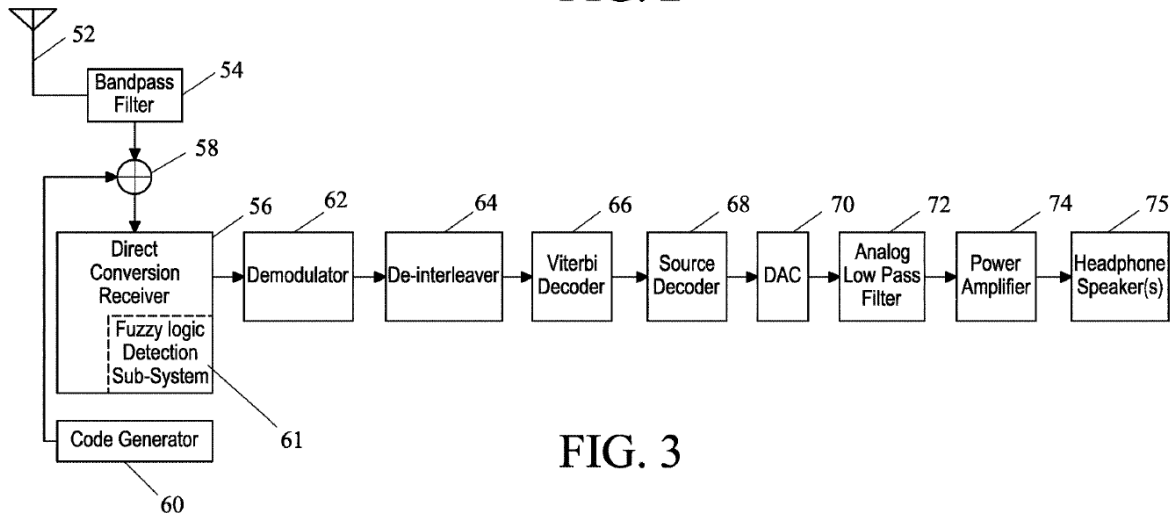**FIRST AMENDED COMPLAINT**

FIG. 2

FIG. 3

'047 Patent, FIGS. 2-3.

23.   In one embodiment, the Patents-in-Suit describe the use of "a code generator 44 that may be used to create a unique user code" and the generated "unique user code" is associated with one wireless digital audio system user. *See* '627 Patent, 2:65-3:1. In one embodiment of the receiver portion, "[t]he receiver code generator 60 may contain the same unique wireless transmission of a signal code word that was transmitted by audio transmitter 20 specific to a particular user." *See id.*, 3:23-26.

DEFENDANTS' ACTS

24.   Samsung has manufactured, used, sold, offered to sell, and imported into the United States a variety of portable, mobile, and other wireless audio products that provide wireless transmission and/or reception of an audio signal in compliance with versions of the Bluetooth

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and/or Wi-Fi Direct[3] standards from the Bluetooth Special Interest Group ("Bluetooth SIG")[4] and Wi-Fi Alliance[5] respectively, and that infringed the Patents-in-Suit.

25.   During the Period of Exclusivity, Samsung manufactured, used, sold, offered to sell, and imported into the United States portable, mobile, and other wireless audio products that receive a wireless audio signal in accordance with a Bluetooth standard or 802.11/Wi-Fi Direct standard, e.g., Bluetooth 5.0 or Wi-Fi Direct v1.5, (the "Accused Receiver Products"), including, but not limited to:

- Wireless headphones, including the "Galaxy Buds" line of headphones;
- Wireless speakers, including the "Level Box" and "Sound Tower" lines of speakers;
- Projectors, including the "Freestyle" line of projectors;
- Smartphones, including the "Galaxy" line of smartphones
- Televisions and other audiovisual products; and
- Soundbars and home audio systems.

The Accused Receiver Products meet all claim limitations of at least claim 1 of the '047 Patent, claim 1 of the '627 Patent, and claim 9 of the '000 Patent and thus Samsung's manufacture, use, sale, offer for sale, and importation into the United States of the Accused Receiver Products infringed at least claim 1 of the '047 Patent and the '627 Patent.

26.   The Accused Receiver Products include Bluetooth-compatible products that comprise a portable or mobile digital audio spread spectrum audio receiver.

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[3] Wi-Fi Direct is also known as Wi-Fi Peer-to-Peer ("P2P").
[4] Samsung Electronics Co., Ltd. is an "Associate" member of Bluetooth SIG and Samsung Electronics America, Inc. is an "Adopter" member of Bluetooth SIG. *See* https://www.bluetooth.com/develop-with-bluetooth/join/member-directory/. Bluetooth SIG is the organization that oversees the development of Bluetooth standards.
[5] Samsung Electronics is a "Sponsor" member of Wi-Fi Alliance. *See* https://www.wi-fi.org/member-companies. The Wi-Fi Alliance is the organization that oversees the development of Wi-Fi standards.

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27.   The receivers of the Accused Receiver Products receive a unique user code, e.g.,

BD_ADDR and unique user-friendly name ("UFN"), from a digital audio spread spectrum

transmitter during, e.g., device discovery, pairing, and/or audio streaming.

3.2.2 Bluetooth Device Name (the user-friendly name)

3.2.2.1 *Definition*

> The Bluetooth device name is the user-friendly name that a Bluetooth device
> exposes to remote devices. For a device supporting the BR/EDR device type,
> the name is a character string returned in the LMP_name_res in response to
> an LMP_name_req. For a device supporting the LE-only device type, the name
> is a character string held in the Device Name characteristic as defined in
> Section 12.1.

BLUETOOTH CORE SPECIFICATION, Version 5.0 Vol. 3, Part C, Section 3.2.2, p. 1988, available at

https://www.bluetooth.com/specifications/specs/core-specification-amended-5-0/; *see also id.*,

Section 6, pp. 2022-30; Section 7.1-7.7, pp. 2031-38 (discussing protocols for obtaining the

BD_ADDR and UFN); Vol. 2, Part E, Section 6.23, p. 749 ("The user-friendly Local Name

provides the user the ability to distinguish one BR/EDR Controller from another."); *id.*, Part B,

Section 1.2.1, p. 357 (discussing a "user BD_ADDR"). For example, a unique user code is sent by

the transmitter in response to the "Remote_Name_Request" command.

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7.1.19 Remote Name Request Command

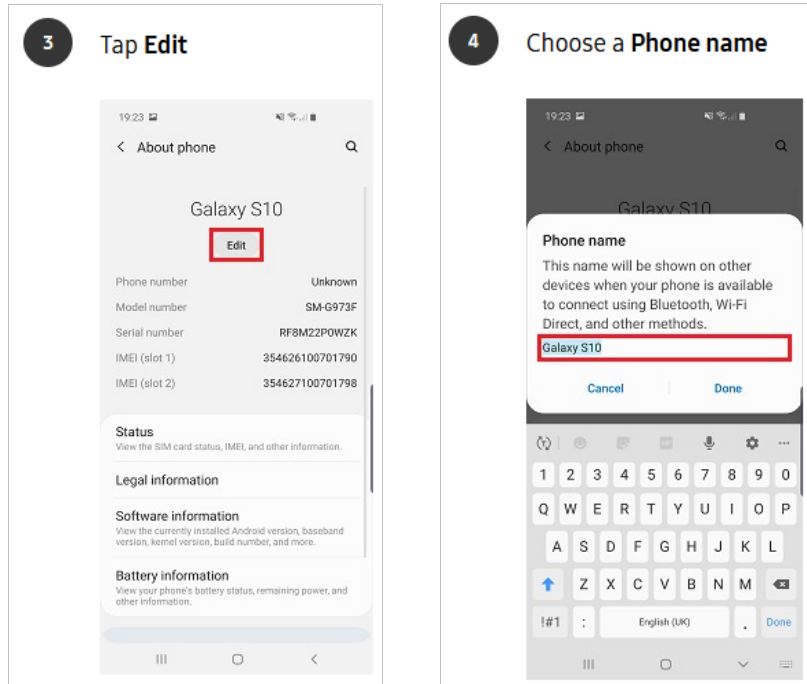| Command	OCF	Command Parameters	Return Parameters
HCI_Remote_Name_Request	0x0019	BD_ADDR, Page_Scan_Repetition_Mode, Reserved, Clock_Offset	

Description:

The Remote_Name_Request command is used to obtain the user-friendly name of another BR/EDR Controller. The user-friendly name is used to enable the user to distinguish one BR/EDR Controller from another. The BD_ADDR command parameter is used to identify the device for which the user-friendly name is to be obtained. The Page_Scan_Repetition_Mode parameter specifies the page scan repetition mode supported by the remote device with the BD_ADDR. This is the information that was acquired during the inquiry process. The Clock_Offset parameter is the difference between its own clock

BLUETOOTH CORE SPECIFICATION, Version 5.0 Vol. 2, Part E, Section 7.1.19, p. 800, available at

https://www.bluetooth.com/specifications/specs/core-specification-amended-5-0/.

28.   Users of a Bluetooth-compatible transmitter and of Accused Receiver Products

could personalize or customize the UFN of the Bluetooth-compatible device, for example as shown

below in the context of a proprietary interface on a Samsung smartphone.

How do I change the name of my device?

Your device has a name that will be visible when connecting via Bluetooth and
Wi-Fi. By default the name of your device will be same as the name of the model.
For example, a Galaxy S10 will be called Galaxy S10. You can change your
device name to be anything that you want.

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Samsung Support, *What is Bluetooth and how do I use it?*, http://web.archive.org/web/20200807093655/https://www.samsung.com/uk/support/mobile-devices/what-is-bluetooth/

29.   The digital audio spread spectrum receivers of the Accused Receiver Products also receive a high-quality audio signal representation with a frequency range of 20 Hz to 20k Hz (i.e., the range of sound frequencies that the average human can hear high quality music) from another Bluetooth-compatible device with a digital audio spread spectrum transmitter.

30.   Further, the receivers of the Accused Receiver Products are able to communicate wirelessly with digital audio spread spectrum transmitters and receive audio signal representations representative of audio from an audio source, e.g., music streamed from a Bluetooth-compatible smartphone to an Accused Receiver Product via a Bluetooth connection between the two devices.

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Connect Bluetooth Headphones to Samsung Smartphones

Last Update date : Sep 17, 2020

Connecting Bluetooth Headphones   ∧

1   Press and hold the **Play/Pause** key for **3 seconds** to **turn on** the headset. The status indicator flashes red and blue for 3 minutes.

2   When you **turn on** headset for the first time, it automatically enters **Bluetooth pairing mode.**

3   Activate **Bluetooth** option in mobile device and search for **Bluetooth devices.**

4   Tap **Samsung Level U** from the list in mobile device to connect the headset.

Samsung Support, *Connect Bluetooth Headphones to Samsung Smartphones*,
http://web.archive.org/web/20210731102021/https://www.samsung.com/in/support/mobile-devices/connect-bluetooth-headphones-to-samsung-smartphones/.

31.   The digital audio spread spectrum receivers of the Accused Receiver Products include direct conversion modules that can receive wireless spread spectrum signal transmissions representative of the unique user code and the high-quality audio signal representation. For example, on information and belief, all later Bluetooth-compatible devices include a direct conversion module comprising down conversion circuity. Additionally, the received transmissions are encoded for further noise immunity. For example, the received transmissions can be encoded using various spread spectrum techniques to avoid interference, one such spread spectrum technique used is adaptive frequency hopping ("AFH"):

7.2   ADAPTIVE FREQUENCY HOPPING

Adaptive Frequency Hopping (AFH) allows Bluetooth devices to improve their immunity to interference from and avoid causing interference to other devices in the 2.4 GHz ISM band. The basic principle is that Bluetooth channels are classified into two categories, *used* and *unused*, where used channels are part of the hopping sequence and unused channels are replaced in the hopping sequence by used channels in a pseudo-random way. This classification
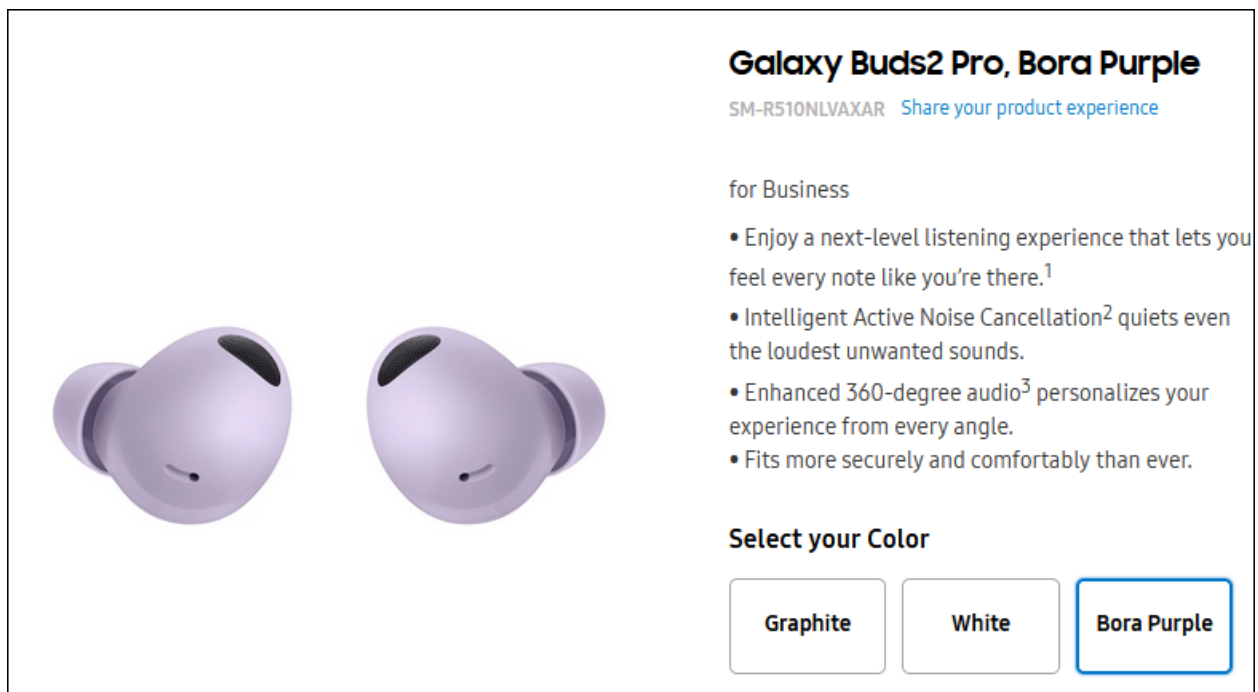
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BLUETOOTH CORE SPECIFICATION, Version 5.0 Vol. 1, Part A, Section 7.1, p. 258, available at

https://www.bluetooth.com/specifications/specs/core-specification-amended-5-0/. Additionally,

Bluetooth-compatible devices can use pulse shaping to reduce intersymbol interference ("ISI").

BLUETOOTH CORE SPECIFICATION, Version 5.0 Vol. 2, Part A, Section 3.2.1.3, p. 331, available

at https://www.bluetooth.com/specifications/specs/core-specification-amended-5-0/.

32.   As discussed above, the digital audio spread spectrum receivers of the Accused

Receiver Products are able to process the high quality audio signals, which have frequency ranges

of 20 Hz to 20 kHz.

33.   Also, the digital audio spread spectrum receivers of the Accused Receiver Products

necessarily include digital-to-analog converters ("DAC") to convert the digital information in the

received audio signal to corresponding analog information in order to generate an audio output.

34.   The Accused Receiver Products include one or more speakers that operate to

reproduce the generated audio output. For example, Samsung Galaxy Buds include one speaker in

each of the left and right portions of the headphones.

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https://web.archive.org/web/20220811174907/https://www.samsung.com/us/business/mobile/audio/headphones/galaxy-buds2-pro-bora-purple-sm-r510nlvaxar/. The one or more speakers of the Accused Receiver Products only reproduce audible audio content sent from the digital audio spread spectrum transmitter in a Bluetooth-compatible device "paired" with the respective Accused Receiver Product.

35.   The digital audio spread spectrum receivers of the Accused Receiver Products use independent code division multiple access communication and the received unique user code to communicate only with the digital audio spread spectrum transmitter in a Bluetooth-compatible device "paired" with the respective Accused Receiver Product during a wireless connection. For example, the Bluetooth specification is based on a type of code-division multiple access ("CDMA") known as frequency hopping code division multiple access ("FH-CDMA"). *See, e.g.,* Jaap Haartsen, IEEE 2000, page 8; Shehu Hassan Ayagi, *Performance Analysis of Bluetooth Network in the Presence of Wi- System*, COMPUTER ENGINEERING AND INTELLIGENT SYSTEMS, Vol. 5, No. 9, 2014.

36.   The digital audio spread spectrum receivers of the Accused Receiver Products demodulate received modulated transmissions in order to generate a demodulated signal and the demodulation includes at least one of a differential phase shift keying ("DPSK") demodulation and a non-DPSK demodulation.

Acronym or abbreviation	Writing out in full	Comments
DPSK	Differential Phase Shift Keying	Generic description of Enhanced Data Rate modulation

BLUETOOTH CORE SPECIFICATION, Version 5.0 Vol. 1, Part B, Acronyms and Abbreviations, p.

269, available at https://www.bluetooth.com/specifications/specs/core-specification-amended-5-

0/.

The general Enhanced Data Rate packet format is shown in Figure 1.3. Each
packet consists of 6 entities: the access code, the header, the guard period, the
synchronization sequence, the Enhanced Data Rate payload and the trailer.
The access code and header use the same modulation mode as for Basic Rate
packets while the synchronization sequence, the Enhanced Data Rate payload
and the trailer use the Enhanced Data Rate modulation mode. The guard time
allows for the transition between the modulation modes.

ACCESS CODE	HEADER	GUARD	SYNC	ENHANCED DATA RATE PAYLOAD	TRAILER

GFSK ———>   <——— DPSK ———>

Figure 1.3: Standard Enhanced Data Rate packet format

BLUETOOTH CORE SPECIFICATION, Version 5.0 Vol. 2, Part B, Baseband Specification, p. 355,

available at https://www.bluetooth.com/specifications/specs/core-specification-amended-5-0/.

37.   The Accused Receiver Products include Wi-Fi Direct-compatible products that

comprise a portable or mobile digital audio spread spectrum audio receiver.

38.   The receivers of the Accused Receiver Products receive a unique user code, e.g.,

unique "friendly name", from a digital audio spread spectrum transmitter during, e.g., device

discovery, pairing, and/or audio streaming.

3.1   P2P discovery

3.1.1   Introduction

P2P Discovery enables P2P Devices to quickly find each other and form a
connection.

P2P Discovery consists of the following major components:

— **Device Discovery** facilitates two P2P Devices arriving on a common
channel and exchanging device information (e.g. device name and device
type).

WI-FI ALLIANCE, *Wi-Fi Peer-to-Peer (P2P) Technical Specification*, version 1.5, p. 24.

> Device Discovery (and optional Service Discovery) is intended to determine which P2P Devices may attempt to connect. Device selection may be based on non-unique information, e.g. Device Name, which potentially introduces ambiguity in this process. P2P Device manufacturers should attempt to create unique Device Names and user interfaces that maximize the probability of selecting the correct device, but there will be cases where device selection is non-deterministic. Group Formation uses the authentication provided by Wi-Fi Simple Configuration [2] to determine that the correct devices are connected. Group Formation may need to be executed more than once with different P2P devices to resolve the case of multiple devices with the same Device Name.

WI-FI ALLIANCE, *Wi-Fi Peer-to-Peer (P2P) Technical Specification*, version 1.5, p. 38.

Table 29—Device Info attribute format

Field Name	Size (octets)	Value	Description
Device Name	variable	As defined in [2]	Friendly name of the P2P Device. Contains the entire WSC Device Name attribute in TLV format (see [2]). Note — Byte ordering within the Device Name field shall be big-endian.

WI-FI ALLIANCE, *Wi-Fi Peer-to-Peer (P2P) Technical Specification*, version 1.5, p. 94.

Table 31—P2P Client Info Descriptor format

Field Name	Size (octets)	Value	Description
Device Name	variable	As defined in [2]	Friendly name of the P2P Client. Contains the entire WSC Device Name attribute in TLV format (see [2]). Note — Byte ordering within the Device Name field shall be big-endian.

WI-FI ALLIANCE, *Wi-Fi Peer-to-Peer (P2P) Technical Specification*, version 1.5, p. 95-96.

For example, a unique user code is sent by the transmitter in a P2P Information Element ("P2P IE").

> A P2P Device shall include the WSC IE in all transmitted Beacon, Probe Request and Response frames. Both the Device Name and Primary Device Type are required attributes in the WSC IE. The Secondary Device Type List is an optional attribute in the WSC IE. The inclusion of the WSC IE in the Probe Response frame sent by a P2P Device allows it to advertise human-readable device-specific information. It should be noted that this information is openly advertised.

WI-FI ALLIANCE, *Wi-Fi Peer-to-Peer (P2P) Technical Specification*, version 1.5, p. 54.
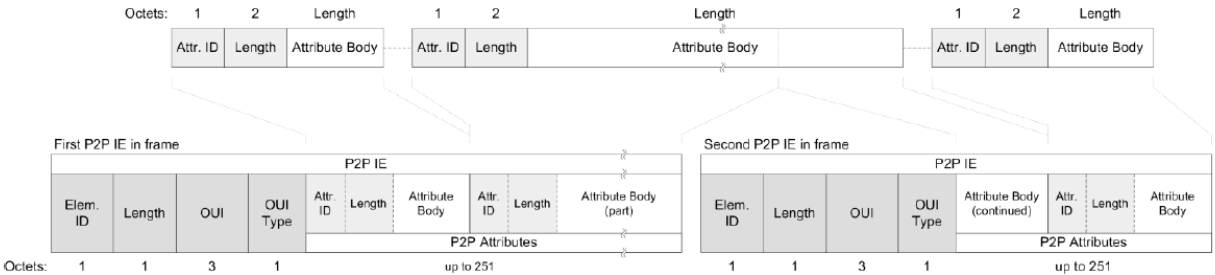
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Figure 19—Example of P2P attributes carried in two P2P IEs

WI-FI ALLIANCE, *Wi-Fi Peer-to-Peer (P2P) Technical Specification*, version 1.5, p. 81.

39.   Users of a Wi-Fi Direct-compatible transmitter and of Accused Receiver Products could personalize or customize the friendly name of the Wi-Fi Direct-compatible device, for example as shown below in the context of a proprietary interface on a Samsung smartphone.
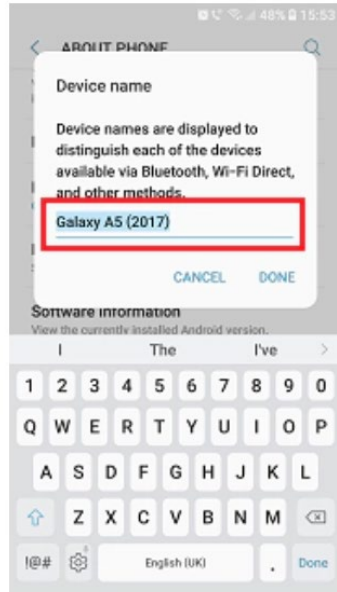
How do I change the name of my device?

Your device has a name that is visible when you connect to other devices via Bluetooth or Wi-Fi networks. The default name of your device will normally be the name of your model e.g. Galaxy Tab S3 or Galaxy S8+

You can change the name by going into **Settings**, choosing **About device** or **About tablet**, and then tapping **Device name**.

Follow the steps below to see how this will show on your screen. Note that your device may appear slightly different depending on your model, operating system and customisation.
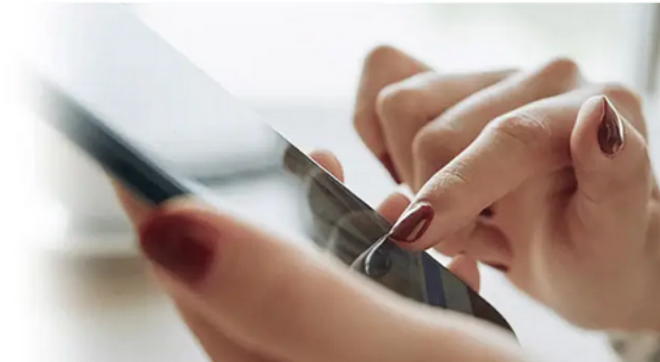
Samsung Support, *What is Bluetooth and how do I use it?*,
https://web.archive.org/web/20221205211624/https://www.samsung.com/ie/support/mobile-devices/how-do-i-change-the-name-of-my-device/

40.   The digital audio spread spectrum receivers of the Accused Receiver Products also receive a high-quality audio signal representation with a frequency range of 20 Hz to 20kHz (i.e., the range of sound frequencies that the average human can hear high quality music) from another Wi-Fi Direct-compatible device with a digital audio spread spectrum transmitter.

41.   Further, the receivers of the Accused Receiver Products are able to communicate wirelessly with digital audio spread spectrum transmitters and receive audio signal representations representative of audio from an audio source, e.g., music streamed from a Wi-Fi Direct-compatible smartphone to an Accused Receiver Product via a direct Wi-Fi connection between the two devices.

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How to connect other devices using Wi-Fi Direct?

Last Update date : 2022-08-11

Wi-Fi Direct is a wireless technology that allows two devices to establish a direct, peer-to-peer Wi-Fi connection without requiring a wireless router. It's like Bluetooth in that you need to introduce each Wi-Fi Direct capable device to the other and create a connection.

Learn how to use Wi-Fi Direct feature to connect two devices via WLAN without requiring an access point. To connect devices using Wi-Fi Direct, follow the below steps:

1. Open **Settings** on you device and Select **Wi-Fi**

2. Tap **Wi-Fi Direct**. The device will scan for Wi-Fi Direct devices automatically.

3. Locate and select the device you would like to connect to.

3. Locate and select the device you would like to connect to.

4. The other device will receive an Invitation to connect, Tap **Accept** for the connection to be made.

Use Wi-Fi direct on Samsung TV ⌄

Samsung Support, *How to connect other devices using Wi-Fi Direct?*, https://www.samsung.com/ae/support/mobile-devices/how-to-connect-other-devices-using-wi-fi-direct/ (last updated August 11, 2020).

42. The digital audio spread spectrum receivers of the Accused Receiver Products include direct conversion modules that can receive wireless spread spectrum signal transmissions representative of the unique user code and the high-quality audio signal representation. For example, on information and belief, all Wi-Fi Direct-compatible devices include a direct

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conversion module comprising down conversion circuity. Additionally, the received transmissions are encoded for further noise immunity. For example, the received transmissions can be encoded using various spread spectrum techniques to avoid interference, one such spread spectrum technique used is Direct Sequence Spread Spectrum ("DSSS") which is used in, at least, the 802.11b and 802.11g standards for wireless communication:

IEEE 802.11 PHY Standards			
Standard	Frequency Band (GHz)	Bandwidth (MHz)	Modulation
802.11	2.4 GHz	20 MHz	DSSS, FHSS
802.11b	2.4 GHz	20 MHz	DSSS
802.11a	5 GHz	20 MHz	OFDM
802.11g	20 MHz	2.4 GHz	DSSS, OFDM

https://www.tek.com/en/documents/primer/wi-fi-overview-80211-physical-layer-and-transmitter-measurements. Additionally, the Accused Receiver Products encode the received transmissions to reduce intersymbol interference ("ISI"), at least by utilizing pulse shaping in 802.11b and 802.11g to reduce ISI.
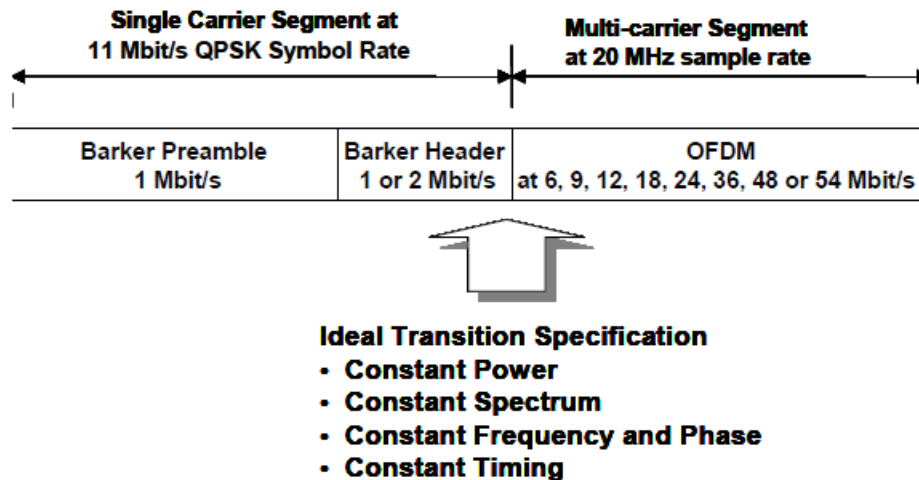
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Single Carrier Segment at 11 Mbit/s QPSK Symbol Rate		Multi-carrier Segment at 20 MHz sample rate
Barker Preamble 1 Mbit/s	Barker Header 1 or 2 Mbit/s	OFDM at 6, 9, 12, 18, 24, 36, 48 or 54 Mbit/s

Ideal Transition Specification
- **Constant Power**
- **Constant Spectrum**
- **Constant Frequency and Phase**
- **Constant Timing**

Figure 153G—Single carrier to multicarrier transition definition

19.7.2.1 Spectral binding requirement

The spectral binding requirement allows the receiver's estimate of the channel state information to be transferred from the single-carrier packet segment to the multicarrier packet segment. This requirement establishes a coherent relationship between the end-to-end frequency responses of the single carrier and multicarrier segments.

During reception of the single carrier preamble and header, the receiver may estimate the channel impulse response. In practice, this could be accomplished through Barker code correlation. The channel impulse response contains end-to-end frequency response information about the linear distortion experienced by the signal due to filters and multipath. This distortion can be mitigated with an equalizer or other commonly known techniques.

The channel impulse response estimate generated during the single carrier packet segment will include the single carrier's pulse-shaping, filter frequency response used to control the single carrier's transmit spectrum and transmit impulse response. The single carrier's pulse-shaping filter may be distinct from the shaping technique used for the multicarrier segment.

The spectral binding requirement states that the linear distortions experienced by the single carrier signal and the linear distortions experienced by the multicarrier signal have a known relationship. This relationship is defined by this specification and shall be manifested by all compliant transmit radios. This will allow any receiver to exploit channel information derived during the single carrier segment and reuse the channel information during the multicarrier segment, if desired.

Three elements have been itemized for this specification to achieve spectral binding. All three elements are necessary to achieve spectral binding, and they are discussed in the next three subclauses. The first element focuses on distortions common to both the single carrier packet segment and the multicarrier packet segment. The second element deals with pulse-shaping unique to the OFDM packet segment. The third element deals with pulse-shaping unique to the single carrier packet segment. The multicarrier pulse shape discussion precedes the single carrier's pulse shape discussion because it is believed this will be a more comfortable progression, due to similar multicarrier pulse-shaping considerations contained in Clause 17.

IEEE COMPUTER SOCIETY, *IEEE Std 802.11g Amendment 4: Further Higher Data Rate Extension in the 2.4 GHz Band*, p. 32.

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43.   As discussed above, the digital audio spread spectrum receivers of the Accused Receiver Products are able to process the high quality audio signals, which have frequency ranges of 20 Hz to 20 kHz.

44.   Also, the digital audio spread spectrum receivers of the Accused Receiver Products necessarily include digital-to-analog converters ("DAC") to convert the digital information in the received audio signal to corresponding analog information in order to generate an audio output.

https://web.archive.org/web/20210130160117/https://www.samsung.com/levant/tablets/galaxy-tab-a/galaxy-tab-active3-8-inch-black-64gb-lte-sm-t575nzkamid/.

45.   The Accused Receiver Products include one or more speakers that operate to reproduce the generated audio output. For example, Samsung 's Galaxy Tab Active3 includes one speakers for audio playback.

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Audio and Video	Video Playing Format
	MP4, M4V, 3GP, 3G2, WMV, ASF, AVI, FLV, MKV, WEBM
	Audio Playing Format
	MP3, M4A, 3GA, AAC, OGG, OGA, WAV, WMA, AMR, AWB, FLAC, MID, MIDI, XMF, MXMF, IMY, RTTTL, RTX, OTA

https://web.archive.org/web/20210130160117/https://www.samsung.com/levant/tablets/galaxy-tab-a/galaxy-tab-active3-8-inch-black-64gb-lte-sm-t575nzkamid/.

The one or more speakers of the Accused Receiver Products only reproduce audible audio content sent from the digital audio spread spectrum transmitter in a Wi-Fi Direct-compatible device "paired" with the respective Accused Receiver Product.

46.   The digital audio spread spectrum receivers of the Accused Receiver Products use independent code division multiple access communication—e.g., an ad hoc wireless network, where devices communicate directly using a code to separate signals and do so without centralized control—and the received unique user code to communicate only with the digital audio spread spectrum transmitter in a Wi-Fi Direct-compatible device "paired" with the respective Accused Receiver Product during a wireless connection. For example, 802.11b can utilize DSSS and 802.11g can utilize DSSS and/or OFDM, so a multiplexing technique with a DSSS code separating signals can be used. As another example, the unique user code (e.g. unique friendly name, a UTF-8 encoding) is used to separate signals.

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A P2P Group has a single SSID and provides one security domain.

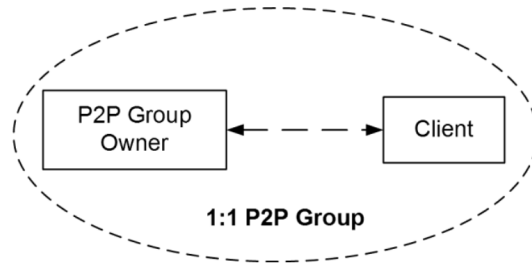Figure 2 illustrates a 1:1 topology, which is a subset of P2P 1:n topology (n=1).

Figure 2—A subset of P2P 1:n topology (n=1)

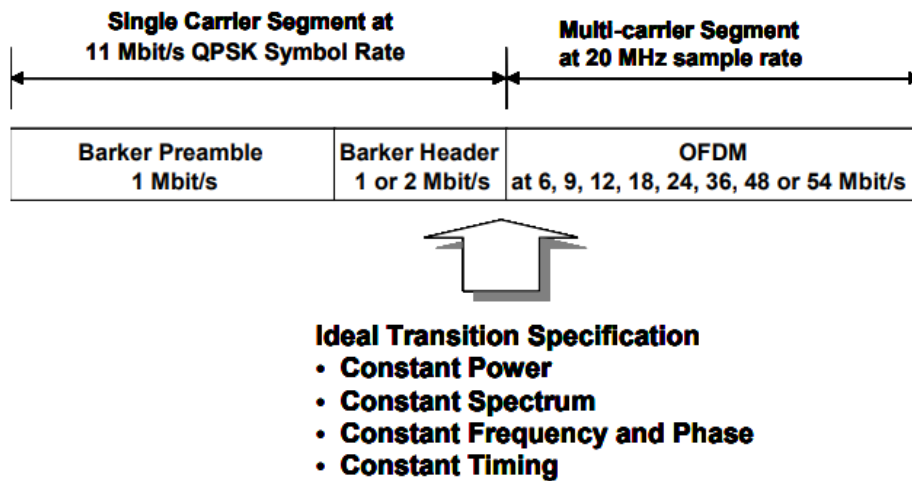WI-FI ALLIANCE, *Wi-Fi Peer-to-Peer (P2P) Technical Specification*, version 1.5, p. 20.

Figure 153G—Single carrier to multicarrier transition definition

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., *IEEE Std 802.11g-2003 (Amendment to IEEE Std 802.11, 1999 Edition, as amended by IEEE Stds 802.11a-1999, 802.11b-1999, 802.11b-1999/Cor 1-2001, and 802.11d-2001), IEEE Standard for Information Technology—Telecommunications and Information Exchange between Systems—Local and Metropolitan Area Networks—Specific Requirements—Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications—Amendment 4: Further Higher Data Rate Extension in the 2.4 GHz Band.*, p. 32.

47.   The digital audio spread spectrum receivers of the Accused Receiver Products demodulate received modulated transmissions in order to generate a demodulated signal and the demodulation includes at least one of a differential phase shift keying ("DPSK") demodulation

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and a non-DPSK demodulation. For example, shown below are examples of two carriers utilized

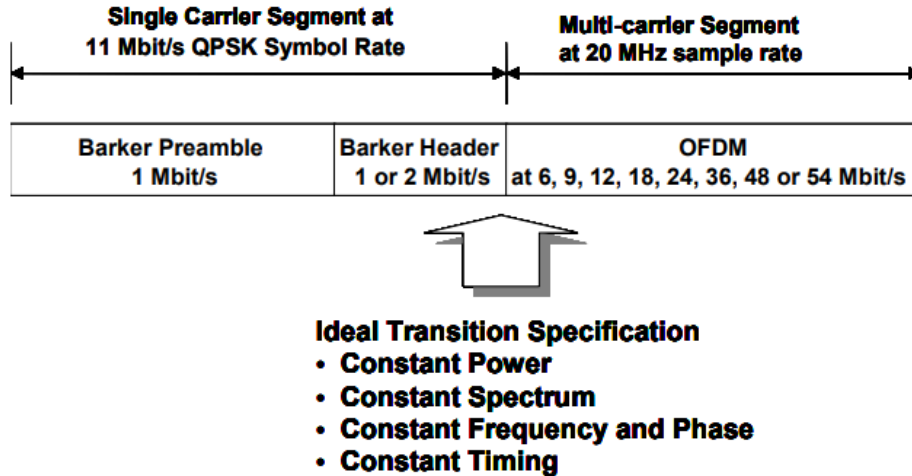in Wi-Fi Direct: DSSS employing DPSK and DPSK that is used to demodulate.

Figure 153G—Single carrier to multicarrier transition definition

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., *IEEE Std 802.11g-2003 (Amendment to IEEE Std 802.11, 1999 Edition, as amended by IEEE Stds 802.11a-1999, 802.11b-1999, 802.11b-1999/Cor 1-2001, and 802.11d-2001), IEEE Standard for Information Technology—Telecommunications and Information Exchange between Systems—Local and Metropolitan Area Networks—Specific Requirements—Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications—Amendment 4: Further Higher Data Rate Extension in the 2.4 GHz Band.*, p. 32.
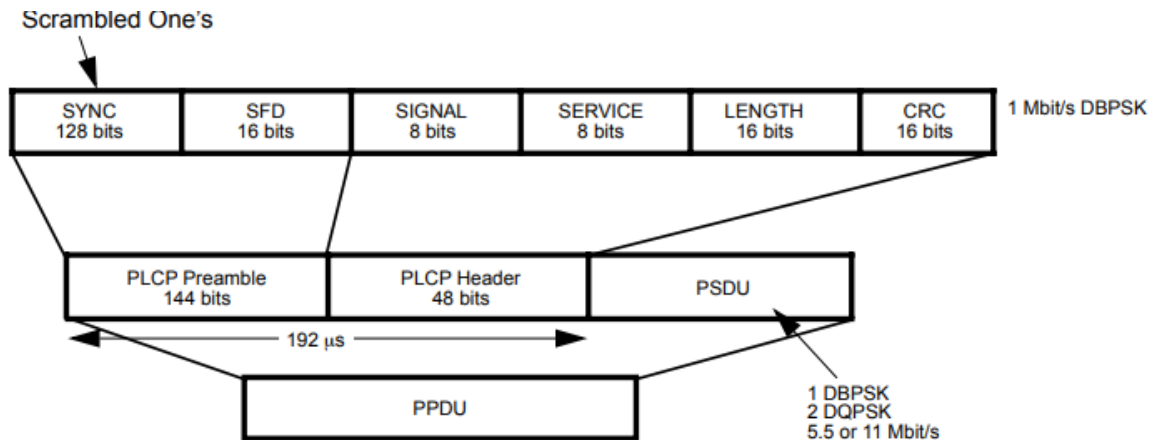

Figure 127—Long PLCP PPDU format

18.2.2.2 Short PLCP PPDU format (optional)

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC , *IEEE STD 802.11B-1999, SUPPLEMENT TO IEEE STANDARD FOR INFORMATION TECHNOLOGY—TELECOMMUNICATIONS AND INFORMATION EXCHANGE BETWEEN SYSTEMS—LOCAL AND METROPOLITAN AREA NETWORKS—SPECIFIC REQUIREMENTS—PART 11: WIRELESS LAN MEDIUM ACCESS CONTROL (MAC) AND PHYSICAL LAYER (PHY) SPECIFICATIONS: HIGHER-SPEED PHYSICAL LAYER EXTENSION IN THE 2.4 GHZ BAND,* p. 13.

48.   During the Period of Exclusivity, Samsung manufactured, used, sold, offered to sell, and imported into the United States portable or mobile wireless audio products that transmit a wireless audio signal in accordance with versions of the Bluetooth and/or 802.11/Wi-Fi Direct standards (the "Accused Transmitter Products"), including, but not limited to:

- Smartphones, including the "Galaxy" line of smartphones;
- Tablets, including the "Galaxy Tab" line of tablets;
- Laptops, including the "Galaxy Book" line of laptops;
- Smartwatches, including the "Galaxy Watch" line of watches;
- Projectors, including the "Freestyle" line of projectors; and
- Televisions and other home audiovisual products.

The Accused Transmitter Products meet all claim limitations of at least claim 17 of the '047 Patent, at least claim 5 of the '627 Patent, and at least claim 8 of the '000 Patent and thus Samsung's manufacture, use, sale, offer for sale, and importation into the United States of the Accused Receiver Products infringes at least claim 17 of the '047 Patent, at least claim 5 of the '627 Patent, and at least claim 8 of the '000 Patent.

49.   The Accused Transmitter Products include Bluetooth-compatible products that comprise a portable or mobile digital audio spread spectrum audio transmitter.

50.   The transmitters of the Accused Transmitter Products transmit a unique user code, e.g., BD_ADDR and unique user-friendly name ("UFN"), to a digital audio spread spectrum receiver during, e.g., device discovery, pairing, and/or audio streaming.

3.2.2 Bluetooth Device Name (the user-friendly name)

3.2.2.1 *Definition*

The Bluetooth device name is the user-friendly name that a Bluetooth device

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exposes to remote devices. For a device supporting the BR/EDR device type,
the name is a character string returned in the LMP_name_res in response to
an LMP_name_req. For a device supporting the LE-only device type, the name
is a character string held in the Device Name characteristic as defined in
Section 12.1.

BLUETOOTH CORE SPECIFICATION, Version 5.0 Vol. 3, Part C, Section 3.2.2, p. 1988, available at

https://www.bluetooth.com/specifications/specs/core-specification-amended-5-0/; *see also id.*,

Section 6, pp. 2022-30; Section 7.1-7.7, pp. 2031-38 (discussing protocols for obtaining the

BD_ADDR and UFN); Vol. 2, Part E, Section 6.23, p. 749 ("The user-friendly Local Name

provides the user the ability to distinguish one BR/EDR Controller from another.") *id.*, Part B,

Section 1.2.1, p. 357 (discussing a "user BD_ADDR"). For example, a unique user code is sent by

the transmitter in response to the "Remote_Name_Request" command.

7.1.19 Remote Name Request Command

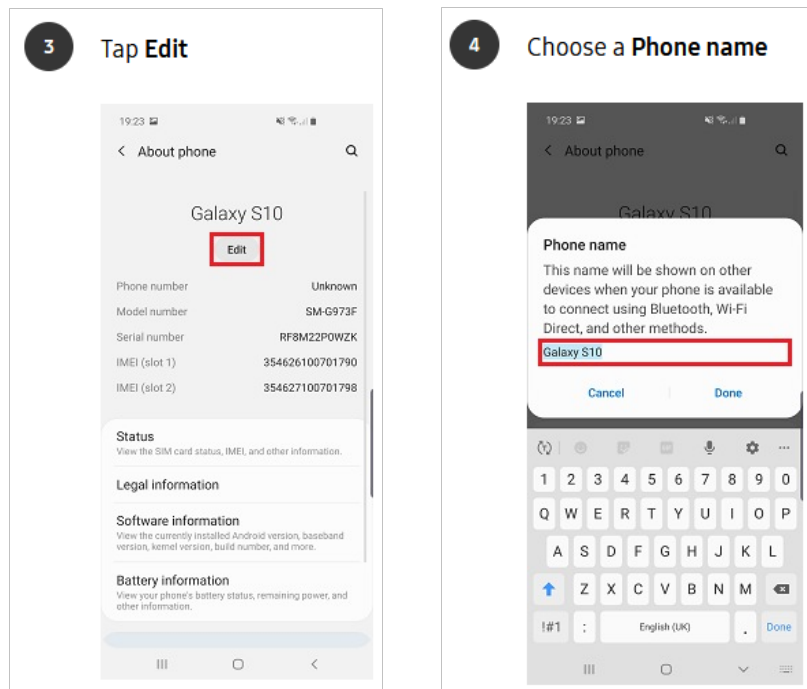| Command	OCF	Command Parameters	Return Parameters
HCI_Remote_Name_Request	0x0019	BD_ADDR, Page_Scan_Repetition_Mode, Reserved, Clock_Offset	

Description:

The Remote_Name_Request command is used to obtain the user-friendly
name of another BR/EDR Controller. The user-friendly name is used to enable
the user to distinguish one BR/EDR Controller from another. The BD_ADDR
command parameter is used to identify the device for which the user-friendly
name is to be obtained. The Page_Scan_Repetition_Mode parameter specifies
the page scan repetition mode supported by the remote device with the
BD_ADDR. This is the information that was acquired during the inquiry
process. The Clock Offset parameter is the difference between its own clock

BLUETOOTH CORE SPECIFICATION, Version 5.0 Vol. 2, Part E, Section 7.1.19, p. 800, available at

https://www.bluetooth.com/specifications/specs/core-specification-amended-5-0/.

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51.   Users of a Bluetooth-compatible receiver and of the Accused Transmitter Products could personalize or customize the UFN of the Bluetooth-compatible device, for example as shown below in the context of a proprietary interface on a Samsung smartphone.

Renaming your Bluetooth

Your device has a name that will be visible when connecting via Bluetooth and Wi-Fi. By default the name of your device will be same as the name of the model. For example, a Galaxy S10 will be called Galaxy S10. You can change your device name to be anything that you want.

Samsung Support, *What is Bluetooth and how do I use it?*, http://web.archive.org/web/20200807093655/https://www.samsung.com/uk/support/mobile-devices/what-is-bluetooth/

52.   The spread spectrum audio transmitters of the Accused Transmitter Products also transmit audio signal representations with a frequency range of 20 Hz to 20kHz (e.g, the range of sound frequencies that the average human can hear high-quality music) to another Bluetooth-compatible device with a digital audio spread spectrum receiver.

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53.   Further, the transmitters of the Accused Transmitter Products are able to communicate wirelessly with digital audio spread spectrum receivers, e.g., transmitting music from an Accused Transmitter Product to a Bluetooth-compatible receiver via a Bluetooth connection between the two devices, and can be moved during operation.

Samsung Support, *Connect Bluetooth Headphones to Samsung Smartphones*, http://web.archive.org/web/20210731102021/https://www.samsung.com/in/support/mobile-devices/connect-bluetooth-headphones-to-samsung-smartphones/.

54.   The digital audio spread spectrum transmitters of the Accused Transmitter Products include encoders that can process signals in the 20 Hz to 20kHz frequency range and encode a representation of the audio signal in order to reduce interference associated with communicating the transmitted representation of the audio signal. For example, the transmitted representations are encoded using various spread spectrum techniques to avoid interference, one such spread spectrum technique used is adaptive frequency hopping ("AFH"):

7.2 ADAPTIVE FREQUENCY HOPPING

Adaptive Frequency Hopping (AFH) allows Bluetooth devices to improve their immunity to interference from and avoid causing interference to other devices in the 2.4 GHz ISM band. The basic principle is that Bluetooth channels are classified into two categories, *used* and *unused*, where used channels are part of the hopping sequence and unused channels are replaced in the hopping sequence by used channels in a pseudo-random way. This classification

BLUETOOTH CORE SPECIFICATION, Version 5.0 Vol. 1, Part A, Section 7.1, p. 258, available at

https://www.bluetooth.com/specifications/specs/core-specification-amended-5-0/. Additionally,

Bluetooth-compatible devices can use pulse shaping to reduce intersymbol interference ("ISI").

BLUETOOTH CORE SPECIFICATION, Version 5.0 Vol. 2, Part A, Section 3.2.1.3, p. 331, available

at https://www.bluetooth.com/specifications/specs/core-specification-amended-5-0/.

55.   Separate from the encoding and processing by the encoder, the digital coded audio

spread spectrum transmitters of the Accused Transmitter Products perform a modulation on the

representation of the audio signal, using at least one of a differential phase shift keying ("DPSK")

modulation and a non-DPSK modulation, and generate a modulated signal based on the

performance of the modulation(s).

Acronym or abbreviation	Writing out in full	Comments
DPSK	Differential Phase Shift Keying	Generic description of Enhanced Data Rate modulation

BLUETOOTH CORE SPECIFICATION, Version 5.0 Vol. 1, Part B, Acronyms and Abbreviations, p.

269, available at https://www.bluetooth.com/specifications/specs/core-specification-amended-5-0/.

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The general Enhanced Data Rate packet format is shown in Figure 1.3. Each packet consists of 6 entities: the access code, the header, the guard period, the synchronization sequence, the Enhanced Data Rate payload and the trailer. The access code and header use the same modulation mode as for Basic Rate packets while the synchronization sequence, the Enhanced Data Rate payload and the trailer use the Enhanced Data Rate modulation mode. The guard time allows for the transition between the modulation modes.

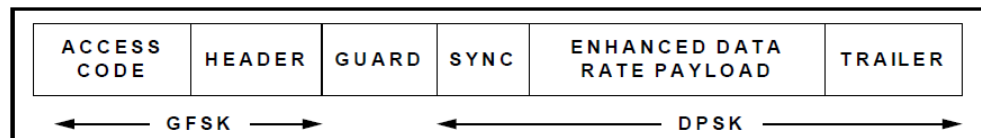| ACCESS CODE	HEADER	GUARD	SYNC	ENHANCED DATA RATE PAYLOAD	TRAILER

GFSK → ← DPSK →

Figure 1.3: Standard Enhanced Data Rate packet format

BLUETOOTH CORE SPECIFICATION, Version 5.0 Vol. 2, Part B, Baseband Specification, p. 355, available at https://www.bluetooth.com/specifications/specs/core-specification-amended-5-0/.

56.   The wireless digital coded audio spread spectrum transmitters of the Accused Transmitter Products use the modulated signal and independent code division multiple access communication to wirelessly transmit a representation of the audio signal. For example, the Bluetooth specification is based on a type of code-division multiple access ("CDMA") known as frequency hopping code division multiple access ("FH-CDMA"). *See, e.g.,* Jaap Haartsen, IEEE 2000, page 8; Shehu Hassan Ayagi, *Performance Analysis of Bluetooth Network in the Presence of Wi-Fi System*, COMPUTER ENGINEERING AND INTELLIGENT SYSTEMS, Vol. 5, No. 9, 2014. Further, the unique user code transmitted by the wireless digital coded audio spread spectrum transmitters of the Accused Transmitter Products distinguishes the audio signal representation transmitted by the corresponding transmitter from other transmitted audio signals that may be present in the spread spectrum transmitter spectrum. For example, a Bluetooth-compatible device "paired" with a respective Accused Transmitter Product will use the unique user code to ignore other audio signal representations that may be present in its vicinity.

57.   The Accused Transmitter Products include Wi-Fi Direct-compatible products that comprise a portable or mobile digital audio spread spectrum audio transmitter.

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58.   The transmitters of the Accused Transmitter Products transmit a unique user code,

e.g., unique "friendly name", to a digital audio spread spectrum receiver during, e.g., device

discovery, pairing, and/or audio streaming.

3.1   P2P discovery

3.1.1   Introduction

P2P Discovery enables P2P Devices to quickly find each other and form a connection.

P2P Discovery consists of the following major components:

— **Device Discovery** facilitates two P2P Devices arriving on a common channel and exchanging device information (e.g. device name and device type).

WI-FI ALLIANCE, *Wi-Fi Peer-to-Peer (P2P) Technical Specification*, version 1.5, p. 24.

Device Discovery (and optional Service Discovery) is intended to determine which P2P Devices may attempt to connect. Device selection may be based on non-unique information, e.g. Device Name, which potentially introduces ambiguity in this process. P2P Device manufacturers should attempt to create unique Device Names and user interfaces that maximize the probability of selecting the correct device, but there will be cases where device selection is non-deterministic. Group Formation uses the authentication provided by Wi-Fi Simple Configuration [2] to determine that the correct devices are connected. Group Formation may need to be executed more than once with different P2P devices to resolve the case of multiple devices with the same Device Name.

WI-FI ALLIANCE, *Wi-Fi Peer-to-Peer (P2P) Technical Specification*, version 1.5, p. 38.

Table 29—Device Info attribute format

Field Name	Size (octets)	Value	Description
Device Name	variable	As defined in [2]	Friendly name of the P2P Device. Contains the entire WSC Device Name attribute in TLV format (see [2]). Note — Byte ordering within the Device Name field shall be big-endian.

WI-FI ALLIANCE, *Wi-Fi Peer-to-Peer (P2P) Technical Specification*, version 1.5, p. 94.

Table 31—P2P Client Info Descriptor format

Field Name	Size (octets)	Value	Description
Device Name	variable	As defined in [2]	Friendly name of the P2P Client. Contains the entire WSC Device Name attribute in TLV format (see [2]). Note — Byte ordering within the Device Name field shall be big-endian.

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WI-FI ALLIANCE, *Wi-Fi Peer-to-Peer (P2P) Technical Specification*, version 1.5, p. 95-96.

59.   Users of a Wi-Fi Direct-compatible receiver and of the Accused Transmitter Products could personalize or customize the UFN of the Bluetooth-compatible device, for example as shown below in the context of a proprietary interface on a Samsung smartphone.
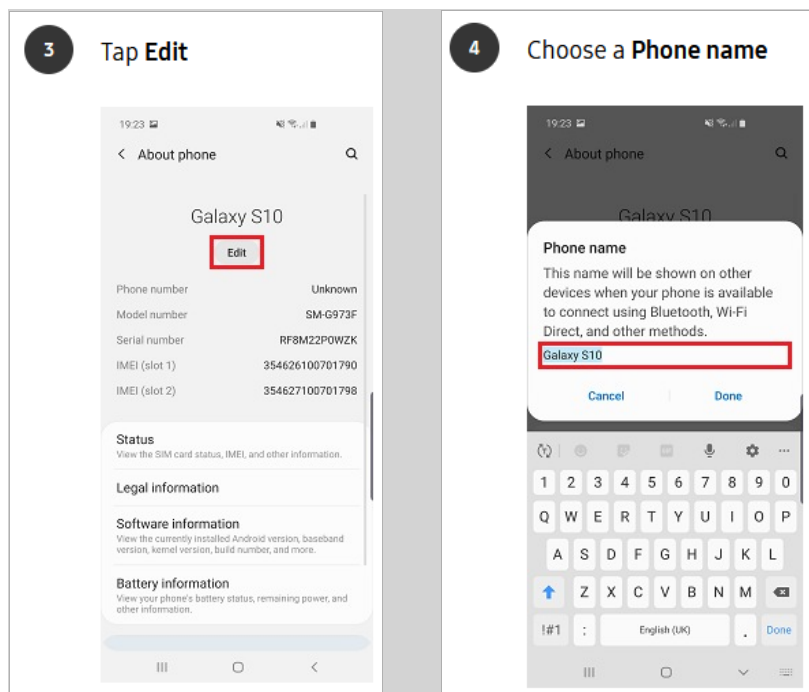
How do I change the name of my device?

Your device has a name that is visible when you connect to other devices via Bluetooth or Wi-Fi networks. The default name of your device will normally be the name of your model e.g. Galaxy Tab S3 or Galaxy S8+

You can change the name by going into **Settings**, choosing **About device** or **About tablet**, and then tapping **Device name**.

Follow the steps below to see how this will show on your screen. Note that your device may appear slightly different depending on your model, operating system and customisation.

Samsung Support, *What is Bluetooth and how do I use it?*, https://web.archive.org/web/20221205211624/https://www.samsung.com/ie/support/mobile-devices/how-do-i-change-the-name-of-my-device/
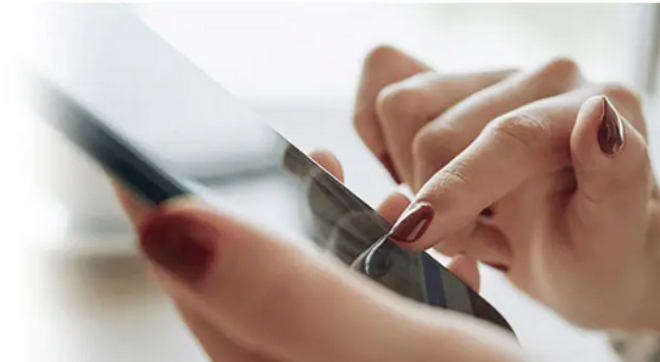

Samsung Support, *What is Bluetooth and how do I use it?*, http://web.archive.org/web/20200807093655/https://www.samsung.com/uk/support/mobile-devices/what-is-bluetooth/

<div align="right">

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60.   The spread spectrum audio transmitters of the Accused Transmitter Products also transmit audio signal representations with a frequency range of 20 Hz to 20kHz (e.g, the range of sound frequencies that the average human can hear high-quality music) to another Wi-Fi Direct-compatible device with a digital audio spread spectrum receiver.

61.   Further, the transmitters of the Accused Transmitter Products are able to communicate wirelessly with digital audio spread spectrum receivers, e.g., transmitting music from an Accused Transmitter Product to a Wi-Fi Direct -compatible receiver via a Wi-Fi Direct connection between the two devices, and can be moved during operation.

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How to connect other devices using Wi-Fi Direct?

Last Update date : 2022-08-11

Wi-Fi Direct is a wireless technology that allows two devices to establish a direct, peer-to-peer Wi-Fi connection without requiring a wireless router. It's like Bluetooth in that you need to introduce each Wi-Fi Direct capable device to the other and create a connection.

Learn how to use Wi-Fi Direct feature to connect two devices via WLAN without requiring an access point. To connect devices using Wi-Fi Direct, follow the below steps:

1. Open **Settings** on you device and Select **Wi-Fi**

2. Tap **Wi-Fi Direct**. The device will scan for Wi-Fi Direct devices automatically.

3. Locate and select the device you would like to connect to.

3. Locate and select the device you would like to connect to.

4. The other device will receive an Invitation to connect, Tap **Accept** for the connection to be made.

Use Wi-Fi direct on Samsung TV   ⌄

Samsung Support, *How to connect other devices using Wi-Fi Direct?*,

https://www.samsung.com/ae/support/mobile-devices/how-to-connect-other-devices-using-wi-fi-direct/ (last updated August 11, 2020).

62.   The digital audio spread spectrum transmitters of the Accused Transmitter Products include encoders that can process signals in the 20 Hz to 20kHz frequency range and encode a representation of the audio signal in order to reduce interference associated with communicating

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the transmitted representation of the audio signal. For example, the associated transmissions of the representations are encoded using various techniques; such techniques include pulse shaping in 802.11b and 802.11g which reduce ISI.
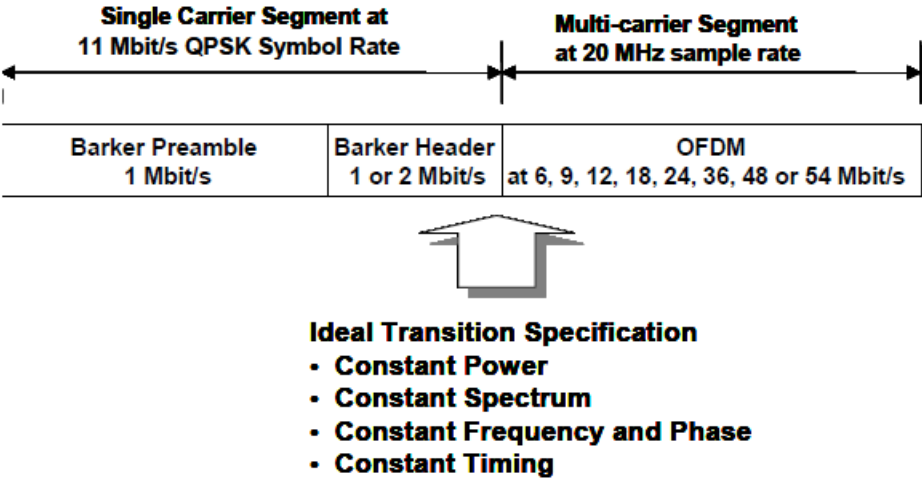
Single Carrier Segment at 11 Mbit/s QPSK Symbol Rate		Multi-carrier Segment at 20 MHz sample rate
Barker Preamble 1 Mbit/s	Barker Header 1 or 2 Mbit/s	OFDM at 6, 9, 12, 18, 24, 36, 48 or 54 Mbit/s

Ideal Transition Specification
- **Constant Power**
- **Constant Spectrum**
- **Constant Frequency and Phase**
- **Constant Timing**

Figure 153G—Single carrier to multicarrier transition definition

19.7.2.1 Spectral binding requirement

The spectral binding requirement allows the receiver's estimate of the channel state information to be transferred from the single-carrier packet segment to the multicarrier packet segment. This requirement establishes a coherent relationship between the end-to-end frequency responses of the single carrier and multicarrier segments.

During reception of the single carrier preamble and header, the receiver may estimate the channel impulse response. In practice, this could be accomplished through Barker code correlation. The channel impulse response contains end-to-end frequency response information about the linear distortion experienced by the signal due to filters and multipath. This distortion can be mitigated with an equalizer or other commonly known techniques.

The channel impulse response estimate generated during the single carrier packet segment will include the single carrier's pulse-shaping, filter frequency response used to control the single carrier's transmit spectrum and transmit impulse response. The single carrier's pulse-shaping filter may be distinct from the shaping technique used for the multicarrier segment.

The spectral binding requirement states that the linear distortions experienced by the single carrier signal and the linear distortions experienced by the multicarrier signal have a known relationship. This relationship is defined by this specification and shall be manifested by all compliant transmit radios. This will allow any receiver to exploit channel information derived during the single carrier segment and reuse the channel information during the multicarrier segment, if desired.

Three elements have been itemized for this specification to achieve spectral binding. All three elements are necessary to achieve spectral binding, and they are discussed in the next three subclauses. The first element focuses on distortions common to both the single carrier packet segment and the multicarrier packet segment. The second element deals with pulse-shaping unique to the OFDM packet segment. The third element deals with pulse-shaping unique to the single carrier packet segment. The multicarrier pulse shape discussion precedes the single carrier's pulse shape discussion because it is believed this will be a more comfortable progression, due to similar multicarrier pulse-shaping considerations contained in Clause 17.

IEEE COMPUTER SOCIETY, IEEE Std 802.11g Amendment 4: Further Higher Data Rate Extension

in the 2.4 GHz Band, p. 32.

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63.   Separate from the encoding and processing by the encoder, the digital coded audio spread spectrum transmitters of the Accused Transmitter Products perform a modulation on the representation of the audio signal, using at least one of a differential phase shift keying ("DPSK") modulation and a non-DPSK modulation, and generate a modulated signal based on the performance of the modulation(s).

2.4.1   Basic functions and services

This specification assumes that all the STA functions and services to pass the following WFA Certifications are implemented in P2P Devices:

— WFA certification for at least 802.11g, which includes WPA2

WI-FI ALLIANCE, *Wi-Fi Peer-to-Peer (P2P) Technical Specification*, version 1.5, p. 21.

In order to promote efficient wireless medium use:

— P2P Devices shall not use 11b rates (1, 2, 5.5, 11 Mbps) for data and management frames except:
  ▪ Probe Request frames sent to both P2P Devices and non-P2P Devices.
— P2P Devices shall not respond to Probe Request frames that indicate support for 11b rates only.

WI-FI ALLIANCE, *Wi-Fi Peer-to-Peer (P2P) Technical Specification*, version 1.5, p. 21.

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7.3 Management frame body components

7.3.1 Fixed fields

7.3.1.4 Capability Information field

Change the first and second paragraphs in 7.3.1.4 as shown:

The Capability Information field contains a number of subfields that are used to indicate requested or advertised optional capabilities.

The length of the Capability Information field is 2 octets. The Capability Information field consists of the following subfields: ESS, IBSS, CF-Pollable, CF-Poll Request, Privacy, Short Preamble, Packet Binary Convolutional Code (PBCC), and Channel Agility, Short Slot Time, and DSSS-OFDM. The format of the Capability Information field is illustrated in Figure 27. No subfield is supplied for ERP as a STA supports ERP operation if it includes all of the Clause 19 mandatory rates in its supported rate set.
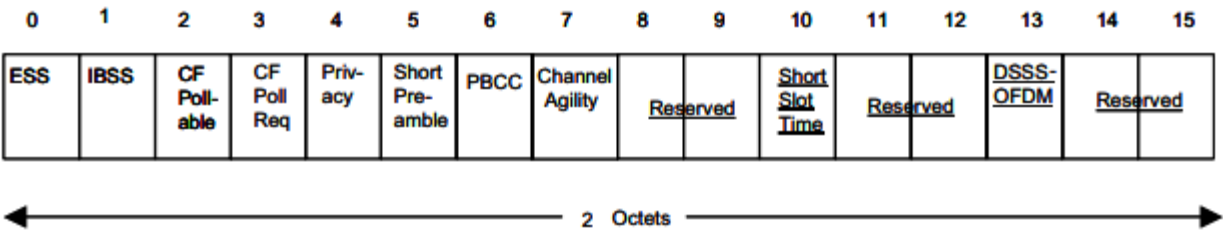
Replace Figure 27 with the following:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
ESS	IBSS	CF Poll-able	CF Poll Req	Priv-acy	Short Pre-amble	PBCC	Channel Agility	Reserved		Short Slot Time	Reserved		DSSS-OFDM	Reserved	

◄———————————————— 2 Octets ————————————————►

Figure 27—Capability Information fixed field

WI-FI ALLIANCE, Wi-Fi Peer-to-Peer (P2P) Technical Specification, version 1.5, p. 21.
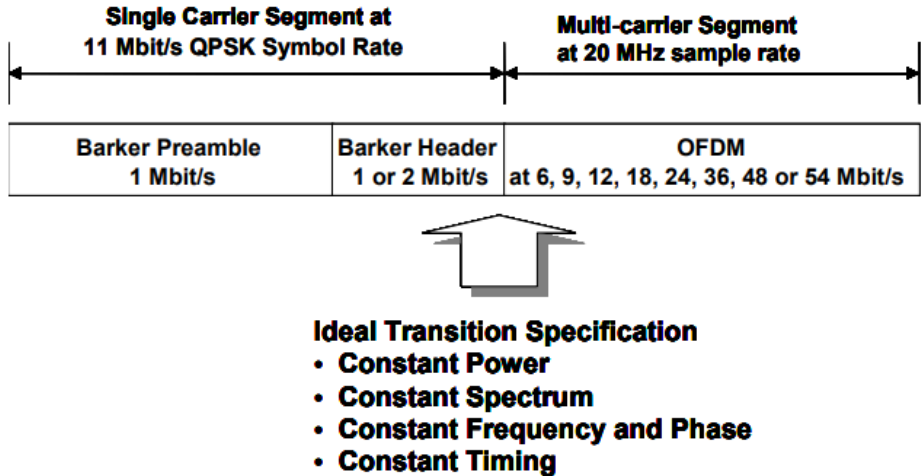
Figure 153G—Single carrier to multicarrier transition definition

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., *IEEE Std 802.11g-2003 (Amendment to IEEE Std 802.11, 1999 Edition, as amended by IEEE Stds 802.11a-1999, 802.11b-1999, 802.11b-1999/Cor 1-2001, and 802.11d-2001), IEEE Standard for Information Technology—Telecommunications and Information Exchange between Systems—Local and Metropolitan Area Networks—Specific Requirements—Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications—Amendment 4: Further Higher Data Rate Extension in the 2.4 GHz Band.*, p. 32.
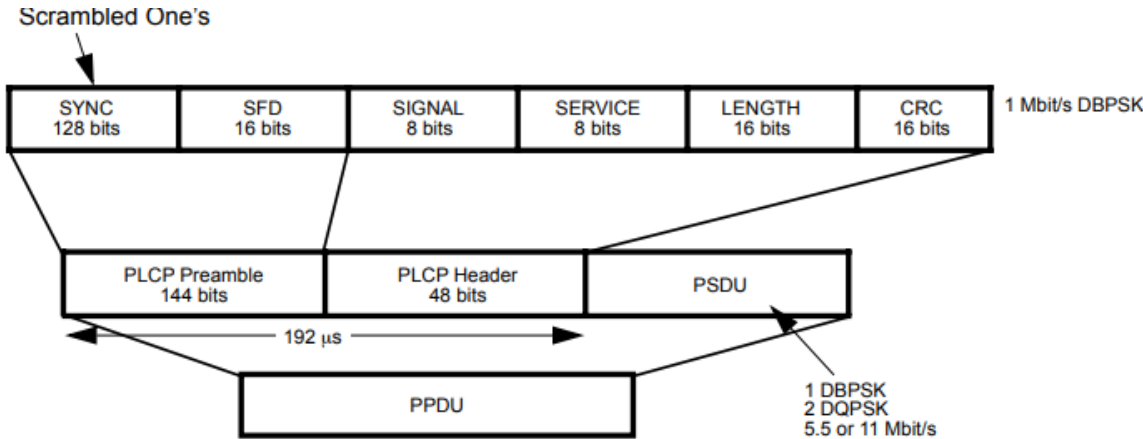
Figure 127—Long PLCP PPDU format

18.2.2.2 Short PLCP PPDU format (optional)

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC , *IEEE STD 802.11B-1999, SUPPLEMENT TO IEEE STANDARD FOR INFORMATION TECHNOLOGY—TELECOMMUNICATIONS AND INFORMATION EXCHANGE BETWEEN SYSTEMS—LOCAL AND METROPOLITAN AREA NETWORKS—SPECIFIC REQUIREMENTS—PART 11: WIRELESS LAN MEDIUM ACCESS CONTROL (MAC) AND PHYSICAL LAYER (PHY) SPECIFICATIONS: HIGHER-SPEED PHYSICAL LAYER EXTENSION IN THE 2.4 GHz BAND,* p. 13.

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64.   The wireless digital coded audio spread spectrum transmitters of the Accused Transmitter Products use the modulated signal and independent code division multiple access communication—e.g., an ad hoc wireless network, where devices communicate directly using a code to separate signals and do so without centralized control—to wirelessly transmit a representation of the audio signal. For example, 802.11b can utilize DSSS and 802.11g can utilize DSSS and/or OFDM, so a multiplexing technique with a DSSS code separating signals can be used.

A P2P Group has a single SSID and provides one security domain.
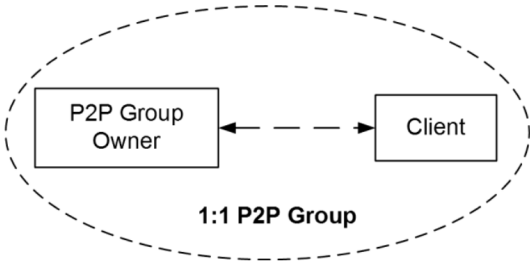Figure 2 illustrates a 1:1 topology, which is a subset of P2P 1:n topology (n=1).

Figure 2—A subset of P2P 1:n topology (n=1)

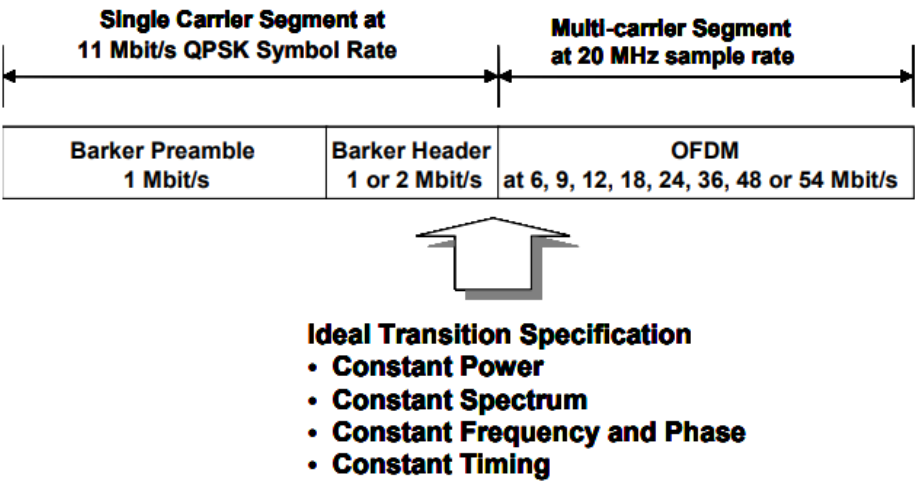WI-FI ALLIANCE, *Wi-Fi Peer-to-Peer (P2P) Technical Specification*, version 1.5, p. 20.

Figure 153G—Single carrier to multicarrier transition definition

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INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., *IEEE Std 802.11g-2003 (Amendment to IEEE Std 802.11, 1999 Edition, as amended by IEEE Stds 802.11a-1999, 802.11b-1999, 802.11b-1999/Cor 1-2001, and 802.11d-2001), IEEE Standard for Information Technology—Telecommunications and Information Exchange between Systems—Local and Metropolitan Area Networks—Specific Requirements—Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications—Amendment 4: Further Higher Data Rate Extension in the 2.4 GHz Band.*, p. 32

As another example, the unique user code (e.g. unique friendly name, a UTF-8 encoding) is used to separate signals. Further, the unique user code transmitted by the wireless digital coded audio spread spectrum transmitters of the Accused Transmitter Products distinguishes the audio signal representation transmitted by the corresponding transmitter from other transmitted audio signals that may be present in the spread spectrum transmitter spectrum.

65.   Samsung provided instructions to its customers and users on how to pair the Accused Receiver Products and Accused Transmitter Products with other Bluetooth-compatible and Wi-Fi Direct-compatible products to wirelessly send and receive audio signal representations and unique user codes as claimed in the Patents-in-Suit:

- "What is Bluetooth and how do I use it?" http://web.archive.org/web/20200807093655/https://www.samsung.com/uk/support/mobile-devices/what-is-bluetooth/;
- "Connect your devices with Bluetooth" http://web.archive.org/web/20200626202241/https://www.samsung.com/us/support/answer/ANS00087102/;
- "Connect Bluetooth Headphones to Samsung Smartphones," http://web.archive.org/web/20210731102021/https://www.samsung.com/in/support/mobile-devices/connect-bluetooth-headphones-to-samsung-smartphones/;
- "Pairing a Bluetooth device to my Samsung Phone" http://web.archive.org/web/20210725203603/https://www.samsung.com/in/support/mobile-devices/pairing-a-bluetooth-device-to-my-samsung-phone/;
- "How to Connect your Galaxy Device with other Bluetooth Devices?" http://web.archive.org/web/20200910221030/https://www.samsung.com/in/support/mobile-devices/how-to-connect-your-galaxy-device-with-other-bluetooth-devices/;
- "How to connect Galaxy watch with Samsung mobile phones?" http://web.archive.org/web/20210929025623/https://www.samsung.com/in/support/mobile-devices/galaxy-watch-how-to-connect-with-mobile-device/#content;
- "How to change the Device Name in Samsung Galaxy Grand2(SM-G7102)?" https://www.samsung.com/in/support/mobile-devices/how-to-change-the-device-name-

in-samsung-galaxy-grand2-sm-g7102/#helpHtg1callOrder0_0 (last updated October 12, 2020);

- "How do I change the name of my device?" http://web.archive.org/web/20200808162159/https://www.samsung.com/uk/support/mobile-devices/how-do-i-change-the-name-of-my-device/;

- "Can Bluetooth Phone users hear my conversation when I am using a Bluetooth headset? https://www.samsung.com/in/support/mobile-devices/can-bluetooth-phone-users-hear-my-conversation-when-i-am-using-a-bluetooth-headset/ (last updated October 13, 2020);

- Samsung Support, What is Bluetooth and how do I use it?, https://web.archive.org/web/20221205211624/https://www.samsung.com/ie/support/mobile-devices/how-do-i-change-the-name-of-my-device/;

- Samsung Support, *How to connect other devices using Wi-Fi Direct?*, https://www.samsung.com/ae/support/mobile-devices/how-to-connect-other-devices-using-wi-fi-direct/ (last updated August 11, 2020); and

- Samsung Support, What is Wi-Fi Direct used for?, https://web.archive.org/web/20201025033442/https://www.samsung.com/nz/support/mobile-devices/what-is-wifi-direct-used-for/

66.   On information and belief, Defendants also implemented contractual controls and protections in the form of license and use restrictions with their customers to preclude the unauthorized reproduction, distribution, and modification of their products.

67.   Moreover, on information and belief, Defendants implemented technical precautions to attempt to thwart customers who would circumvent the intended operation of Defendants' products.

<div align="center">NOTICE</div>

68.   Samsung received notice of its infringement of the Patents-in-Suit via its receipt of a certified letter from One-E-Way dated April 10, 2020. As stated in the letter, the purpose of the April 10, 2020 certified letter was "to address infringement of One-E-Way's patents by initiating a patent licensing discussion with the aim of avoiding patent infringement litigation." The April 10, 2020, letter to Samsung explained, in part, that

> Base[d] on information on Samsung's website, Bluetooth-Compatible products by Samsung have been made, offered and sold for some time and continue to be made and sold, including wireless earbud, headphone, speaker, tablet, computer, TV, smartphone and wearable products (e.g., Galaxy Buds, Noise

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Cancelling Headphones, Radiant360 Speaker, Galaxy Tab Tablet, Chromebook Computer, QLED TV, Galaxy Phone, Galaxy Watch).

The conduct of making, offering, and selling these wireless earbud, headphone, speaker, tablet, computer, TV, smartphone and wearable products in the United States constitutes infringement of One-E-Way's patents, namely the '885, '258, '391, '000, '396, '627 and '047 patents.

69.   Additionally, on information and belief, Samsung also has received actual and/or constructive knowledge of the Patents-in-Suit and the infringing conduct by way of Samsung's own prosecution activities. For example, one of One-E-Way's patents—which the Patents-in-Suit claim priority to—was cited by the examiner during Samsung's prosecution of its application no. 12/565,909 (publication no. US20100171587A1) titled "Audio Device, AV System Having the Audio Device, and Method to Control the Audio Device."

70.   One-E-Way has complied with the requirements of 35 U.S.C §287 with respect to each of the Patents-in-Suit.

71.   Given Samsung's knowledge of the Patents-in-Suit, Samsung knew or was willfully blind to the fact that its products infringed the Patents-in-Suit.

IV. PATENT INFRINGEMENT

COUNT I — INFRINGEMENT OF U.S. PATENT NO. 10,129,627

72.   One-E-Way incorporates by reference the foregoing paragraphs as if fully set forth herein.

73.   Samsung has directly infringed and has induced or contributed to the infringement of at least claims 1 and 5 of the '627 Patent in this judicial district and elsewhere in the United States by, among other things, having made, imported, used, offered for sale, and/or sold without authority of license the claimed systems of the '627 Patent.

74.   The infringing products include the Accused Receiver Products and the Accused Transmitter Products. One-E-Way alleges that each and every element is literally present in the

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Accused Receiver Products and/or the Accused Transmitter Products. To the extent not literally present, One-E-Way reserves the right to proceed under the doctrine of equivalents.

75.   Samsung has also actively induced the infringement of the '627 Patent under 35 U.S.C. § 271(b) by customers and other users. With knowledge of the '627 Patent (at least as of the date of its receipt of the April 10, 2020 letter, learning of the Patents-in-Suit via its prosecution activities, or its receipt of the Original Complaint), Samsung actively directed and aided its customers regarding how to use the Accused Receiver Products and the Accused Transmitter Products in an infringing manner and did so with the intent to encourage its customers and users to directly infringe the '627 Patent. This direction and aid came from Samsung's provision of the Accused Receiver Products and the Accused Transmitter Products along with software, guides, manuals, tutorials, and other documentation and instruction (including, by way of example, information that was located at https://www.samsung.com/in/support/, as described above). Samsung's direction and aid was further found in the firmware and source code embedded in the Accused Receiver Products and the Accused Transmitter Products that directed and executed the direct infringement of the '627 Patent.

76.   Samsung has also contributed to the infringement of one or more claims of the '627 Patent under 35 U.S.C. § 271(c) and/or 271(f), either literally and/or under the doctrine of equivalents, by having sold, offered for sale, and/or imported into the United States, the Accused Receiver Products and the Accused Transmitter Products. Samsung knew that the components of the Accused Receiver Products and the Accused Transmitter Products: constituted a material part of the inventions claimed in the '627 Patent; were especially made or adapted to infringe the '627 Patent; and were not staple articles or commodities of commerce suitable for non-infringing use, but rather the components were used for or in systems that infringed one or more claims of the

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'627 Patent. The hardware and/or software components were not a staple article or commodity of commerce because they were specifically designed to perform the claimed functionality. These products were specifically designed for their infringing purpose, namely operating as part of a wireless digital audio system to wirelessly transmit and/or receive representations of an audio signal between corresponding transmitters and receivers, in part, via the use of a unique user code in accordance with the claims of the '627 Patent. Any other use of the hardware and/or software components would have been unusual, far-fetched, illusory, impractical, occasional, aberrant, and/or experimental.

77.   One-E-Way has been damaged as a result of Samsung's infringing conduct. Samsung is thus liable to One-E-Way in an amount that adequately compensates it for Samsung's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

COUNT II — INFRINGEMENT OF U.S. PATENT NO. 10,468,047

78.   One-E-Way incorporates by reference the foregoing paragraphs as if fully set forth herein.

79.   Samsung has directly infringed and has induced or contributed to the infringement of at least claims 1 and 17 of the '047 Patent in this judicial district and elsewhere in the United States by, among other things, having made, imported, used, offered for sale, and/or sold without authority of license the claimed systems of the '047 Patent.

80.   The infringing products include the Accused Receiver Products and the Accused Transmitter Products. One-E-Way alleges that each and every element is literally present in the Accused Receiver Products and/or the Accused Transmitter Products. To the extent not literally present, One-E-Way reserves the right to proceed under the doctrine of equivalents.

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81.   Samsung has also actively induced the infringement of the '047 Patent under 35 U.S.C. § 271(b) by customers and other users. With knowledge of the '047 Patent (at least as of the date of its receipt of the April 10, 2020 letter, learning of the Patents-in-Suit via its prosecution activities, or its receipt of the Original Complaint), Samsung actively directed and aided its customers regarding how to use the Accused Receiver Products and the Accused Transmitter Products in an infringing manner and did so with the intent to encourage its customers and users to directly infringe the '047 Patent. This direction and aid came from Samsung's provision of the Accused Receiver Products and the Accused Transmitter Products along with software, guides, manuals, tutorials, and other documentation and instruction (including, by way of example, information that was located at https://www.samsung.com/in/support/, as described above). Samsung's direction and aid was further found in the firmware and source code embedded in the Accused Receiver Products and the Accused Transmitter Products that directed and executed the direct infringement of the '047 Patent.

82.   Samsung has also contributed to the infringement of one or more claims of the '047 Patent under 35 U.S.C. § 271(c) and/or 271(f), either literally and/or under the doctrine of equivalents, by having sold, offered for sale, and/or imported into the United States, the Accused Receiver Products and the Accused Transmitter Products. Samsung knew that the components of the Accused Receiver Products and the Accused Transmitter Products: constituted a material part of the inventions claimed in the '047 Patent; were especially made or adapted to infringe the '047 Patent; and were not staple articles or commodities of commerce suitable for non-infringing use, but rather the components were used for or in systems that infringed one or more claims of the '047 Patent. The hardware and/or software components were not a staple article or commodity of commerce because they were specifically designed to perform the claimed functionality. These

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products were specifically designed for their infringing purpose, namely operating as part of a wireless digital audio system to wirelessly transmit and/or receive representations of an audio signal between corresponding transmitters and receivers, in part, via the use of a unique user code in accordance with the claims of the '047 Patent. Any other use of the hardware and/or software components would have been unusual, far-fetched, illusory, impractical, occasional, aberrant, and/or experimental.

83.   One-E-Way has been damaged as a result of Samsung's infringing conduct. Samsung is thus liable to One-E-Way in an amount that adequately compensates it for Samsung's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

COUNT III — INFRINGEMENT OF U.S. PATENT NO. 9,107,000

84.   One-E-Way incorporates by reference the foregoing paragraphs as if fully set forth herein.

85.   Samsung has directly infringed and has induced or contributed to the infringement of at least claim 8 by the Accused Transmitter Products and claim 9 by the Accused Receiver Products in this judicial district and elsewhere in the United States by, among other things having made, imported, used, offered for sale, and/or sold without authority of license the claimed systems of the '000 Patent.

86.   The infringing products include the Accused Receiver Products and the Accused Transmitter Products. One-E-Way alleges that each and every element is literally present in the Accused Receiver Products and/or the Accused Transmitter Products. To the extent not literally present, One-E-Way reserves the right to proceed under the doctrine of equivalents.

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87.   Samsung has also actively induced the infringement of the '000 Patent under 35 U.S.C. § 271(b) by customers and other users. With knowledge of the '000 Patent (at least as of the date of its receipt of the April 10, 2020 letter, learning of the Patents-in-Suit via its prosecution activities, or its receipt of the Original Complaint), Samsung actively directed and aided its customers regarding how to use the Accused Receiver Products and the Accused Transmitter Products in an infringing manner and did so with the intent to encourage its customers and users to directly infringe the '000 Patent. This direction and aid came from Samsung's provision of the Accused Receiver Products and the Accused Transmitter Products along with software, guides, manuals, tutorials, and other documentation and instruction (including, by way of example, information that was located at https://www.samsung.com/in/support/, as described above). Samsung's direction and aid was further found in the firmware and source code embedded in the Accused Receiver Products and the Accused Transmitter Products that directed and executed the direct infringement of the '000 Patent.

88.   Samsung has also contributed to the infringement of one or more claims of the '000 Patent under 35 U.S.C. § 271(c) and/or 271(f), either literally and/or under the doctrine of equivalents, by having sold, offered for sale, and/or imported into the United States, the Accused Receiver Products and the Accused Transmitter Products. Samsung knew that the components of the Accused Receiver Products and the Accused Transmitter Products: constituted a material part of the inventions claimed in the '000 Patent; were especially made or adapted to infringe the '000 Patent; and were not staple articles or commodities of commerce suitable for non-infringing use, but rather the components were used for or in systems that infringed one or more claims of the '000 Patent. The hardware and/or software components were not a staple article or commodity of commerce because they were specifically designed to perform the claimed functionality. These

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products were specifically designed for their infringing purpose, namely operating as part of a wireless digital audio system to wirelessly transmit and/or receive representations of an audio signal between corresponding transmitters and receivers, in part, via the use of a unique user code in accordance with the claims of the '000 Patent. Any other use of the hardware and/or software components would have been unusual, far-fetched, illusory, impractical, occasional, aberrant, and/or experimental.

89.   One-E-Way has been damaged as a result of Samsung's infringing conduct. Samsung is thus liable to One-E-Way in an amount that adequately compensates it for Samsung's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

V.   WILLFULNESS

90.   Samsung was provided notice of One-E-Way's claims at least by way of the April 10, 2020 letter or its receipt of the Original Complaint filed against it.

91.   Samsung acted with knowledge of the Patents-in-Suit despite an objectively high likelihood that its actions constituted infringement of One-E-Way's valid patent rights.

92.   This objectively defined risk was either known or so obvious that it should have been known to Samsung. One-E-Way seeks enhanced damages pursuant to 35 U.S.C. §284.

VI.   JURY DEMAND

93.   One-E-Way demands a trial by jury of all matters to which it is entitled to trial by jury, pursuant to FED. R. CIV. P. 38.

VII.   PRAYER FOR RELIEF

94.   WHEREFORE, Plaintiff One-E-Way prays for judgment and seeks relief against Defendants as follows:

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a.   Judgment that one or more claims of the Patents-in-Suit have been directly and/or indirectly infringed, either literally and/or under the doctrine of equivalents;

b.   Award Plaintiff past damages together with prejudgment and post-judgment interest to compensate for the infringement by Samsung of the Patents-in-Suit in accordance with 35 U.S.C. § 284, and increase such award by up to three times the amount found or assessed in accordance with 35 U.S.C. § 284;

c.   That the Court declare this an exceptional case and award Plaintiff its reasonable attorneys' fees and costs in accordance with 35 U.S.C. § 285; and

d.   That Plaintiff be granted such other and further relief as the Court may deem just and proper under the circumstances.

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Dated: June 17, 2025

Respectfully submitted,

/s/ Andrew G. DiNovo
Andrew G. DiNovo
Texas State Bar No. 00790594
Adam Price
Texas State Bar No. 24027750
Daniel L. Schmid
Texas State Bar No. 24093118
DiNovo Price LLP
7000 N. MoPac Expressway, Suite 350
Austin, Texas 78731
Telephone: (512) 539-2626
Telecopier: (512) 727-6691
adinovo@dinovoprice.com
aprice@dinovoprice.com
dschmid@dinovoprice.com

**ATTORNEYS FOR PLAINTIFF
ONE-E-WAY, INC.**

CERTIFICATE OF SERVICE

I hereby certify that on June 17, 2025, the foregoing document was electronically filed with the Clerk of Court using the Court's CM/ECF system, which will send notification of such filing to all counsel of record who are deemed to have consented to electronic service.

/s/ Andrew G. DiNovo
Andrew G. DiNovo

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